MATERNAL AND CHILD HEALTH IN A SIAMESE RICE VILLAGE: NUTRITIONAL ASPECTS

Studies in Bang Chan, 1952-1954

HAZEL M. HAUCK

With the assistance of Anusith Rajatasilpin, Sapha Indrasud, Soovanee Sudsaneh, Sylvia de la Paz and Barbara J. Smith

CORNELL THAILAND PROJECT
INTERIM REPORTS SERIES
NUMBER FIVE

DATA PAPER NUMBER 39
SOUTHEAST ASIA PROGRAM
DEPARTMENT OF FAR EASTERN STUDIES
CORNELL UNIVERSITY, ITHACA, NEW YORK
NOVEMBER, 1959

PRICE $2.00

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Data Paper: Number 39
Southeast Asia Program
Department of Far Eastern Studies
Cornell University, Ithaca, New York
December, 1959

Price $2.00

FOREWORD

In this Data Paper, Professor Hauck and her associates continue their analysis and reporting of the field research into conditions of health, sanitation, nutritional status, and diet carried out in Thailand during 1952, 1953, and 1954. Research operations were concentrated among the 300 households of the village of Bang Chan, whose population of about 1,700 was made up primarily of rice farming families. This community lies in the central plain of Thailand some twenty roadmiles northeast of the capital, Bangkok, whose proximity provides major and continuing stimuli to cultural change. Investigation of the processes involved in changing cultural behavior in rural Thailand is the primary objective of this and other field research conducted under the auspices of the Cornell Thailand Project.

Reference to earlier reports by Professor Hauck and her associates and to other materials providinghgeneral background information for this study will be found in the bibliographyh included in this interim report. Dr. Hauck, who is Professor of Food and Nutrition in the New York State College of Homeh Economics, CornellhUniversity, designed and supervised the research on basic problems of health in Bang Chan reported on in this and in the other studies cited. Of the other contributors to this present report, Dr. Anusith, who has been working in the MedicalhSchool of Tulane University, is associated with the School of Public Health in Bangkok, and Dr. Saovanee, having completed her doctoral work in nutrition at Harvard University, has returned to Thailand to join the faculty in home economics at Kasetsart University. The Cornell Thailand Project is much indebted to these scholars and to other Thai and American collaborators who have contributed so much to the studies of Bang Chan.

Lauriston Sharp, Director
Cornell Thailand Project

Ithaca, New York
November, 1959

ACKNOWLEDGMENTS

For the period of her field study, 1952-53, the author received an award for advanced research from the United States Educational (Fulbright) Foundation in Thailand.

The author wishes to express her gratitude for the assistance of her Thai co-workers: Dr. Anusith Rajatasilpin and Miss Sapha Indrasud, whose services were provided by the Food and Drug Administration, Bangkok, Thailand, through the courtesy of its director, Dr. Yong H. Chutima; and Miss Saovanee Sudsaneh, who served as field worker withhthe Cornell Thailand Project during 1953-54.

In connection with their graduate study at Cornell, Sylvia de la Paz summarized the observations on feeding practices of children from birthhtohtwo years, and Barbara J. Smith summarized data obtained on growth in height and weight of infants and small children in BanghChan.

The author is particularly grateful for the interest and friendliness of the parents, especiallyhthe mothers of Bang Chan. They patiently answered our questions at each visit and reassured the small children who seldom saw strangers and who were unused to being weighed and measured. Without their generous cooperation this study would not have been possible.

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SUMMARY

Information on health, care, and diet of mothers and small children in Bang Chan, Thailand, was obtained primarily by interview, although some direct observations were made. In general, three areas of inquiry were included in this study: 1) clinical history, especially such information as might have a bearing on the nutrition and health of the child, 2) food intake at various periods, and 3) cultural customs and ideas of interest in relation to the CornelloThailandoProject.

In all, 66 mothers of young children were interviewed. Information on diet during pregnancy, postpartum, and lactation was obtained from women who were either in the stage under discussion or had only recently passed through it.

The description of child feeding practices is based on records obtained concerning 57 children from birth to two years of age, a majority of whom were visited from 5 to 7 times.

Information on growth in height and weight is based on observations made on 71 children, most of whomowere weighedoand measured 6 or 7 times. Observations were made for 30 of these children both before and after weaningo

During pregnancy most women in Bang Chan continued tooeat as usual. A few expressedocravings for certain foods, and a minority thought some kinds of food should not be eaten during pregnancy.

During the postpartum rest period most women ate a very restricted diet. Rice and fish, with salt, were the foods considered by all informants to be appropriate for thisoperiod.

As a rule, diet during lactation, after the mother resumed her usual work, was the customary family diet.o A minority of informants mentioned foods which should not be eaten by a nursing mother.

Evidence of the need to improve diets in this region was provided by the occasional occurrence of beriberi or the history of beriberi among mothers as well as by medical inspection and family dietary studies.

Breast feeding was the rule in Bang Chan. For a majority of infants observed, breast feeding was continued into the second year, and some were breast fed for more than two yearso Few received animal milk after weaning.

A small, rather flavorless banana was given to young babies, sometimes before they were put to the breast. This type of banana and soupy rice were the only supplementary foods given before 6 months of age. Proteinerich foods, chiefly fish and egg, were generally introduced in small amounts during the second half of the first year. Few infants were given vegetables before one year of age, and even then none had them daily. At two years of age, some children had not yet been given green vegetables. Late introduction of vegetables into the child's diet may be due to the fact that vegetables were often prepared as hot curries which were considered unsuitable for young children.

A child was usually allowed foods commonly eaten by adults by the time he was weaned, although a few informants specified that the child could have anything but "hot tasting" foods, i.e. foods containing chili. A minority of informants mentioned other foods as not good for younger babies.

Except for dietary restrictions while the mother was lying by the fire, postpartum, no well established dietary taboos connected with the feeding of mothers or babies were encountered. The concept that a good choice of food is important to the health of both mother and child seemed to be entirely lacking.

Many of the young children in Bang Chan failed to gain, or even lost, weight in the intervals between observations. Almost all infants appeared to gain steadily up to 6 months of age, but stationary weight or weight loss for periods of from 1 to 7 months was observed in most children at some time. These periods were noted more frequently among children from 2 to 3 years old than among younger ones. Such experiences were not more common after weaning than at other times, but the cause or causes of growth failure could not be determined from the information available.

Some approaches to improvement in the diet of Thai mothers and children are suggested. Improvement in the diets of mothers and small children would probably parallel any improvement in the general family dietary, since food is prepared at one time for all members of the familyo

INTRODUCTION

In the study of food habits and health in Bang Chan, Thailand, mothers and small children werethe focus of specialh attention. We were interested in these groups not only for their own sake, but because in an area where frank deficiency disease was not common, inadequacies in the diet might be reflected in thehcondition of these vulnerable groups to a greater extent than in the general population. Food habits in this ricehproducing village have been described (Hauck, Sudsaneh, and Hanks, 1958; Hauck and Hanks, 1959) and information has been presented on nutrient intakes of 11 families (Hauck, Sudsaneh, and Hanks, 1958; Hauck and Sudsaneh, 1959).

In the present paper, general procedures are described first, followed by sections on 1) health and care of mothers and 2) of infants, 3) diet of mothers during pregnancy, post-partum, and lactation, 4) feeding of infantshand smallhchildren, and 5) growth in height and weight of infants and small children in Bang Chan.

PROCEDURES

Some of the information presented herein was obtained by direct observation, but much of it resulted from interviews, usually with the mother. One of our first tasks, therefore, was to develop appropriate schedules for such interviews.h

Schedules for Interviews.

During the early weeks of getting acquainted in the community, wehhad preliminary unstructuredhinterviews with a number of pregnant women and mothers of young babies. Frequentlyhthe child's father,ha grandparenth or other family member would beh present. Informants were encouraged to discuss infant feeding, common customs associated with childbirthh and other subjects of interest to the research group. From the information so obtained and from conversations with workers at the Mother and Child Health Center in Bangkok, two schedules were drawn up. In general, both schedules included threehareas of inquiry: 1) clinical history, especially such informationhas might have a bearing on the nutrition and health of the child, 2) food intake at various periods, and 3) cultural customshand ideas of interest in relation to the Cornell Thailand Project. In this category some items were included because of their interest from the standpoint of an anthropological study ratherhthan because of any assumed relation to nutrition or healthh

One schedule was designed to obtain information about the mother before and after the birth of a given child (Appendix p. 53) and the other for information pertinent to the nutrition and health of the child from birth onward (Appendix p. 56). Clinical history and food intake were included on both schedules. Spaces were allowed to record height and weight of infants and young children at each visit. Questions about cultural customs were included on both schedules, but most such information is reported elsewhere (Hanks, 1959). Descriptions of procedures used in the interviews and observationshare included in the Appendix (p. 58)h

Subjects.

At the beginning of the study we located as many households as possible in which there were pregnant women or young babies. The question, "What families in Bang Chan have young babies or are expecting babies?", was asked of the headman of each hamlet, of groups in a village store, and of families where we visited. We were able to follow up most of the leads obtainedhin this way. If possible the mother was visited sometime before the baby was born; soon after the birth (i.e. within a few days); and then when the infant was 1 month of age, 3 months of age, and at 3-month intervals thereafterh If the first interview occurred after the baby was born, the mother was asked about her diet during the pregnancy, the occurrences at the infant's birth, and his food intake up to the time of the first interview.

In all, 66 mothers of young children were interviewedh The first interview with 17 mothers was held duringhpregnancy; 34 others had infants less than one year old when first seenh and for 15 the youngest child was over one year of ageh For various reasons, such as death of the infant, removal from the village, or failure to find mother and infant at home, complete records were not obtained in all instances. Moreover, after some experience we limited questions concerning pregnancy and postpartum care to women interviewed at these times or to women whose infants were under one year of ageh The descriptions of diet during pregnancy, postpartum, and lactation are based on interviews with from 30 to 50 informantsh

In order to obtain more information, particularly about infants going through the weaning period, older babies in the same households, or in the neighborhood of the households with young infants, were weighed and measured and their food intakes recorded. For these additional children the 3-month interval was usually followed, but they were not necessarily visited at the ages of 6, 9, 12 months, etc.

The description of child feeding practices is based on records concerning 57 children from birth to two years of age, a majority of whom were visited from 5 to 7 timesh

Information on growth in height and weight is based on observationshof 71 children, most of whom were weighed and measured 6 or 7 timesh For 30 of these children, observations were made both before and after weaning.

HEALTH AND GENERAL CARE OF MOTHERSh

Information obtained on menstrual history of girls and women in Bang Chan has been reported previously (Hauck, 1956). The median and modal reported age at menarche was 15 years with a range fromhl3 to 19 years.

Most married women in Bang Chan had children, and of 438 pregnancies reported by 84 mothers, over 90 per cent resulted in live births (Hauck, 1956).

Clinical History and Complaints During Pregnancy.

Most of the women interviewed reported no history of disease which might affect, or be affected by, nutritional statush

Four women had a history of beriberi; 3, a history of malaria; and one had active tuberculosis of which she later died. In relation to the current pregnancy, 6 women had minor complaints such as nausea in earlyhpregnancy, faintness, and leg cramps. The physician considered these as probably physiological. Of the 4 women with more serious complaints, one who saidhshe had pain in the abdomen and legs and difficulty in walking had manifest beriberi when seen a few days after deliveryh

Delivery and Care of Mothers After Childbirth.

Information was obtained from 49 mothers concerning delivery and care afterhchildbirth. For 43 of these women, ages reported were as follows:

Reported Age (years)	Numberhof Mothers
20 or under	7
21-25	11
26-30	12
31-35	6
36-40	6
over 41	1

The mothers interviewed had borne from 1 to 12 children. For 8 of them, this was the first child; but 25, a majority,

had 2 to 4 children. In each case, the information obtained related to the most recent delivery.

Delivery. - In Bang Chan delivery usually took place at home. Four of the mothers we interviewed went to the home of a relative or relative-in-law. In two of these instances the relative was also the midwife; in the others the mother was apparently seeking a place where she could be more satisfactorily looked after than at home.

Three women went to the Health Center at Minburi, about 3 miles from the center of the Bang Chan community, to have their babies. Two of these mothers expected to be delivered at home but were taken to the Health Center when labor proved long. All 3 returned home either on the day of delivery or the next day and lay by the fire. Two others, both school teachers, told us in advance that they expected or hoped to go to the Health Center, but when labor began they were unable to do so because their babies came so quickly. Aside from the 3 who went to the Minburi Health Center, only one of those interviewed went outside the community to have her baby. Informants usually considered the delivery uncomplicated; although, as noted, some labors were long.

Traditional midwives, who were not professionally trained but had learned from other traditional midwives before them, attended most of the mothers. One woman who was alone delivered the baby herself, one said she had no midwife but did not specify other help, and 2 had the help of women who did not ordinarily practice midwifery. The 3 women who were delivered at the Health Center had professionally trained help. Obstetrics as practiced in Bang Chan has been described by Hanks (1959).

Care of Mother During Postpartum Rest Period. - Traditional behavior during the postpartum rest period has been described by Hanks (1959).

Lying by the fire. - The ancient custom of (2)juu (1)faj[1] (literally to be by the fire) after childbirth was still observed by most women in Bang Chan. The chief difference between the practice as we observed it and as it was described in the Bangkok Calendar[2] for 1865 was in the length of the period. In former times this was as much as a month after the birth of the first child, with shorter periods for successive

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1. See Appendix, p. 51 for glossary of Thai terms.

2. The unsigned article entitled "Siamese Obstetrics" was presumably written by the Rev. Dan Beach Bradley, M.D., a Protestant missionary who compiled the Calendar.

births, until with the seventh child it might be dispensed with altogether without harm. In Bang Chan women who observed (2)juu (1)faj rested for an odd number of days, from 5 to 15 in this series. Seven or 9 days was most common. An odd number of days washconsidered good; an even number, bad. A wood fire was customary, although in 2 instances a charcoal brazierhwas used. One woman lay near a charcoal brazier and used a hot ashes chamberh also. With one exception (a non-Thai), even those who did not lie by the fire, but who used the hot ashes chamber, rested an odd number of days.[1]

The traditional ideas on which the custom of lying by the fire was based were described in the Bangkok Calendar (Bradley, 1865):

> "The Siamese theory in regard to the part, which external and internal fire plays in the functions of life and health, is made to work powerfully in these circumstances. It teaches thatthere is, at such times, a dimunution of heat in the body, and consequent liability to stagnation of the blood, which if not guarded against by fire, will leave the uterus flabby and enlarged, bad humors in the circulation, a consequent weak state of the stomach, resulting in the secretion of too little milk, and that of a bad quality for the child, all of which will be likely to be followed by a host of other fearful maladies to both mother and child."

The author, however, attributed deficiency in milk production to the practice of lying by the fire:

> "Nowhit is very remarkable that these last sequences, which are quarded against at so much expense of ease and comfort byhthe custom, are postively and directly brought about by following it. The mothers have but little milk for their babes during the month, and that of a poor quality. Consequently the attendant nurses have to feed them from the hour of their birth with honey, rice-water, and the pulp of soft bananas. This is their almost entire living for the first two or three days, and a large portion of it during the first month."

Of the 5 women we interviewed who did not lie by the fire, 3 used a hot ashes chamber regularly throughout the postpartum rest period, one used it occasionally, and one used both the hot ashes chamber and a hot water bottle. This latter woman

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1. A small metal box in which sticks of fuel were burned. The box was wrapped in cloth and placed on the mother's abdomen.

had lived outside the village and returned to the home of her mother, a traditional midwife, for delivery. Eight other women who were delivered by the same midwife observed (2)juu (1)faj. Two of these 5 women who, by using a hot ashes chamber, ventured to take a step away from the tradional practice were non-Thai (Chinese and Mon). Another, a woman aged 40, was having her 12th child. When we interviewedothis woman during pregnancy she said she expected to lie by the fire, but when we visited her after the baby was born she was using a hot ashes chamber. The wife of one of the school teachers, who had observed the traditional (2)juu (1)faj with her first 5 children, said she found "the new way" more convenient; but by using it she had incurred the displeasure of some of the older women, especially her grandmother.

Activity and bathing. - Activity appeared to be rather limited during the postpartum period, but the respondents said they could move about to get someothings for themselves, to eliminate, etc. We saw women sit up on the plank which served as bed to nurse the baby, change the cloths under it, and help to weigh and measure it (i.e. to assist us). Because of the warmth of the fire, and to avoid the smoke, the women turned from side to side frequently.

Bathing was customary during the postpartum rest period. For the first three days this was one of the midwifeós responsibilities in care of the mother (Hanks, 1959)o

Medications. - The 46 women who told us about medications used after childbirth had a total of 63 medicines; i.e., many used more than one kindo With one exception these were taken internally, and all preparations taken internally were mixed with alcoholic liquor (28% alcohol). Of the medications used, only one was prescribed from the Health Center, 4 were home remedies, and the remainder commercial preparations.[1] Two popular brands, snake brand and (1)jaa (1)dauaung, accountedo for 60 per cent of the total.

Milk stimulation. - As already noted, lying by the fire was thought to be favorable to milk secretion. One woman commented that, since she was not a good milk producer, she must lie by the fire more than 7 days. Six women spoke of the hot water which they drank during the postpartum rest period as good for milk productiono A large majority of the women mentioned taking (1)kaeaeng (1)liang, a broth made with dried

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1. According to the label, some of these were supposed to be useful for menstrual and other complaintso as well as for childbirth. Some were even recommended for treatment of various disorders in men as well as women.

fish and vegetables, when asked if they did anything to stimulate milk secretion. Other preparations, each mentioned once or twice, were cobra curry, fried (3)kuj (1)chaaj flower, pork soup with (3)kuj (1)chaaj leaves, dried peas and peppers cooked in palm sugar syrup. Some of the medications used were reputed to stimulate milk flow. Three women spoke of peacock brand medicine and one of a Chinese medicine in this connection. With respect to the Chinese medicine, another informant said she took it "to remove the serum which interferes with milk secretion." One midwife put herbs on her daughter's breast and expressed and discarded the "early milk" which was considered bad for the baby. No association appeared to be made between putting the baby to the breast and stimulation of milk flow.

Drinking water. - Information concerning sources of drinking water used by the mothers was obtained from 46 mothers of young babies. Of these, 20 used canal water, 23 rain water, and 3 used either one. In general, there was a relation between season and source of water used. Most of the mothers whose babies were born between March and October drank rain water, whereas from November to February a majority drank canal water. Some families had enough water jars to preserve rain water for much of the dry season, whereas others had few or no jars and, therefore, could save only small amounts of rain water on a day-to-day basis. In all instances, the water, whatever its source, was boiled for the mother during the postpartum rest period. Forty-six women said they drank the water hot; one said it was warm. One popular traditional midwife said, however, that if the mother had her baby in the hospital, use of boiled water for drinking and bathing was not necessary.

CONDITION AND CARE OF BABIES AT BIRTH AND IN EARLY INFANCY

All information to be reported concerning condition and care of babies at birth and in early infancy relates to infants who were under one year of age when first visited. Thirty infants were seen when they were under 3 months of age.

Condition at Birth.

The condition of the baby at birth was generally described as satisfactory. One infant who died on the third day, before we saw the mother, was said to have cyanosis, failed to cry at birth, and needed to be "helped" for about one-half hour afterward. Three infants had congenital defects: umbilical hernia, inguinal hernia on the right side, and hemangioma on the right groin.

One infant had congenital stridor when seen by the physician[1] at 2 months, but the difficulty in breathing had disappeared spontaneously before the baby was next visited at 3 1/2 months of age.

Illness in Early Infancy

One infant that died on the fifth day was seen when one day old, at which time neither mother nor physician made any adverse comment on its condition. The mother, who was not living with her husband, returned to her work outside the village a week after delivery, and we were unable to talk with her again. So far as we could learn from neighbors, this infant had none of the symptoms concerning which we routinely inquired; namely, convulsions, vomiting, diarrhea, or fever.

A third infant in this series died when he was nearly 2 months old. At 13 days of age, when first seen, this infant had white patches on his tongue which were diagnosed as moniliasis. When the physician saw the child again at 6 weeks of age he made no adverse comments on its condition. Emotional reaction to the infant's death was such that we were unable to get a clear description of events which led up to it from either parents or neighbors.[2]

Three infants had skin infections when seen within a few days after birth. The physician commented that skin was more susceptible to infection when moist than dry and that the babies had become very warm. The weather was hot, and babies were bundled up and/or were near the fire. He gave directions for keeping the skin clean and dusting with sulfa powder.

No deaths from tetanus occurred in this series, although infantile tetanus was prominent among causes of death of infants under one month old (Hauck, 1956).

Medicine Given to Babies During the First Few Days of Life

On this point, information was obtained concerning 36 of 40 babies seen before they were 6 months old. Thirty of these were given medicine, sometimes more than one kind. Most of the

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1. A physician was present at all interviews with pregnant women and mothers with very young infants.

2. Although the mother had children by a previous marriage, this was the first child of this union, born after the parents had lived together for 9 years. The mother was 41 years old.

medications were taken internally, sometimes being painted on the tongue with a feather; but two preparations were applied over the abdomen. Some of the medications were described as "stomach medicine" or "to prevent flatulence." Five different kinds of proprietary medicine were given to 18 infants. In 13 instances, the medicine given was clearly homemade and included as major ingredients items such as flattery fruit, (3)luug (1)yauau; cobra oil; horseshoe crab; and buffalo skin. The nature of the medicine, whether homemade or proprietary, was not clear in 8 instances. Usually medicine for infants was mixed with honey, but in 2 cases, alcoholic liquor was used as it customarily was for the mother.

Six newborn infants in this series were given no medicine. One of these was born at the Health Center. One of the other 2 infants delivered at the Health Center was given homemade medicine later, and no information was obtained on the third. Eye prophylaxis[1] was probably routine at the Health Center, as, in 2 of the 3 cases delivered there, informants knew that drops had been put in the infant's eyes. Traditional midwives, however, did nothing of this sort.

Water for Drinking and Bathing.

For the newborn infant as well as for the mother, water for drinking and bathing was boiled and was usually used while hot, often being kept warm in a vacuum bottle. Either rain water or canal water might be used depending on what was available at a given season. The water was dribbled from an adult's fingers into the infant's mouth. When the mother was no longer lying by the fire, boiled water was not considered essential for the infant. Nevertheless, over half the infants seen from this time up to 3 months of age were being given boiled water to drink. After 6 months of age this was rare.

In one instance, during the time when a younger sibling received boiled canal water, a 21-month old child was given boiled water also. At the time of a later visit both of these children were drinking unboiled canal water. In another case an orphaned boy's formula was made up with boiled water, although

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1. Vaccination for smallpox was the only modern preventive treatment which we knew to be used in Bang Chan in the absence of an epidemic. Since a severe epidemic of smallpox with many deaths ten years previously, health officers came to the Bang Chan elementary school once a year to vaccinate children, and other residents of the community could be vaccinated at this time. Four of the young children whom we visited periodically were vaccinated, at 4 months, 8 months, 1 and 2 years of age, respectively.

he was given untreated canal water to drinko One young mother gave boiled water to her 15-month old infant for a few days when the baby had diarrhea though onoquestioning she said no one had told her to do this. (The fact that boiled water was used for newborn infants and their mothers may have suggested the procedure to her.) Among the infants who received boiled water for a longer time than most, 4 were children of school teacherso

Early Feeding Practiceso

Breast feeding was usual in Bang Chano but most babies were not put to the breast until the second or third day or even later (Table 1).

Table 1. INITIATION OF BREAST FEEDING BY THE MOTHER FOR 38 INFANTS IN BANG CHAN.

Post natal day	Number of infants
1	1
2	11
3	22
4	2
5	2

As previously noted, no association was apparently made between putting the baby to the breastoand estabdishing the milk flow.

In this series, 9 infants were nursed by a relative or neighbor one or more times before the mother's milk supply was established. Five of these infants had breast milk on the first day, 2 on the second, and 2 onothe third. Choice of a woman who was a good milk producer to give the infant its first milk feeding was considered auspiciouso The procedure was primarily of ritual significance.

Three infants were given cow's milk (diluted, condensed, or dried milk) before being put to the breast.

About half the infants received nooofood other than boiled water and milk while the mother lay by the fireo Honey was given with boiled water to about one-third of the infants, and about one-fourth had crushed banana, sometimes in addition to honeyo When given, these foods were started before breast feeding was establishedo Either raw or baked, a small, rather flavorless variety of banana, (3)kluaj (4)nam-(4)waa, was used. We observed a grandmother dipping her fingers into a bowl of water, then crushing a bit of banana between them and poking this into the infant's mouth o The infant was given as much as he would take, usually about half of a banana at one time. Banana might be fed from one to three times per day.

Exposure of Infants to Sunlighto

Even during the rainy season sunshine was usually abundant in Bang Chan, but taking a baby out of doors at an early age was generally thought tooinvolve some risk. Many houses had low or wide eaves, and an infant was usually kept in a cradle in the house where sunlight could not penetrateo When old enough to hold up its head while sitting astride an older person's hip, the infant might be carried about the compound by parents or older siblings. As the question was worded ("When did you take the baby outside the house?" or "At what age did you take the baby with you when you went out for pleasure?") the answer did not mean that the baby was taken out with any degree of regularity at the specified age. Most of the babies in this series had been taken outdoors by the time they were 3 months old, but 4 were a year or older when first exposed to sunshineo Nevertheless, the physician found no evidence of rickets among the infants he examinedo

One informant, a school teacher's wife, said she thought that taking the baby into the sunshine was not harmful; in fact she believed it made the baby stronger than usualo She thought, however, that too much exposure to sunshine might "bring cold into the baby" and she spoke of the beret as a protection against this.[1] In Bang Chan, an otherwise naked infant might wear a beret when being taken out of doors.

MATERNAL DIET

Diet During Pregnancy.

Of 31 mothers who furnished some information on diet during pregnancy, 17 were pregnant when interviewedo and the remainder had young infants, in most cases under 3 months of ageo Eighteen of the interviews were based on schedule 4 (Appendix p. 53) and provided fairlyodetailed information on the kindsoof foods eaten. Other informants gave more general information, such as foods craved or disliked.

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1. Wellin (1956) mentioned the small woolen cap made or bought by mothers in the Valley of Ica, Peru, for the infant to wearo The cap was put on soon after birth and was worn, off and on, for many months. The function of the cap was to prevent the entrance of cold via the fontanel, which was defined as a particularly vulnerable point of entryo Wellin noted that all infants he saw in maternity wards in the Valley of Ica wore woolen capso

In general, the diet during pregnancy seemed to be about the same as at other times. Rice cooked in the usual way (see glossary, Appendix p. 51) and fish of some kind formed the basis of the diet. A majority had green vegetables[1] either daily or frequently. Foods which seemed to be generally acceptable, although they were eaten less often, included vegetables other than green ones, pork, bananas, coconut, other fruit, fresh beef, and egg.

Eight women spoke of foods which they craved during pregnancy. Fruit in general, or specific fruits such as oranges, pomelo, guava, rambutan, and mangosteen, were most often mentioned. One woman said she craved Chinese noodles, and one, chilies.

When asked whether they disliked any foods during pregnancy, 5 women mentioned fish or the odor of fish, but in 2 instances the objection was limited to early pregnancy when the informants experienced some nausea. Three said they disliked vegetables, and one, hot tasting foods.

Four informants said that hot tasting foods (i.e. foods containing chili peppers) were bad for a pregnant woman; one considered dried and salted fish harmful "because of their fishy odor." One informant thought eggs were bad for a woman during pregnancy. Eggs were, however, the only food mentioned by anyone in Bang Chan as being good for pregnant women. The informant, a woman school teacher, said she ate them often anyway, hence did not alter her intake during pregnancy.

Diet During the Postpartum Rest Period

Of the 42 mothers from whom we obtained information about the food they ate during the postpartum rest period, only 2 said they ate as usual. One of these said she believed that if a mother ate small amounts of many different kinds of foods while lying by the fire, the child would not get diarrhea when he ate these foods for the first time. This woman worked outside the community and may not have acquired her belief about eating a variety of foods within the village. In any event, since her child died at five days of age, one would not expect this mother's eating behavior to have a liberalizing effect on the custom in

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1. Most of the pregnant women were interviewed toward the end of the rainy season when swamp cabbage and (2)phag (2)ka-(2)cheed, the most popular leafy vegetables, were available. From our subsequent experience with the family dietary survey, one would expect that when canals were low, green vegetables would be eaten infrequently by pregnant women as well as by other members of the family.

Bang Chanh The only other woman in this series who did not restrict her diet postpartum was the wife of a school teacher. She said that women were supposed to eat rice with salt or salt fish at this time but that she ate all kinds of food.

As a rule, a woman's diet was considerably curtailed during the postpartum rest periodh Rice and fish were apparently the only foods considered safe by all of the mothers interviewed. About half ate fish, but over half of these ate salted fish only, and about one-fourth ate fresh fish onlyh The only other food eaten by half or more of the mothers was banana of the (4)nam-(4)waa variety, baked bananas being commonly specifiedh Vegetables, when they were eaten, were usually in (1)kaeaeng (1)liang, a broth made with dried fish and reputed to be valuable for milk stimulationh In Bang Chan, the inflorescence of banana was commonly used in making this product, but other vegetables were favored by someh

When asked what foods they considered good for a woman who had recently borne a child no mother knew of any such food, but the list of foods mentioned as being bad for the mother during the postpartum rest period included more than a dozen items mentioned from 1 toh4 times each: egg, sweets, beef, vegetables, meat, pork, poultry, fresh fish, sour tasting foods, jackfruit, mangoes, fruits of all kinds, and glutinous riceh

Fear of illness from eating incompatible foods after child-birth was rather strongly expressed by many informants, evenhby some who knew of Chinese customs which were different from the ancient Thai customsh Some also knew that foods which were customarily forbidden to the woman who had her child at home were not forbidden at the government Health and MaternityhCenter at Minburi.

Diet During Lactation.

The term "diet during lactation" as used here refers toh foods eaten when the mother had resumed her usual work following the postpartum rest periodh The majority of nursing infants were under a year old when the records were obtainedh All of the mothers ate rice everyday cooked in the usual way, and almost all had fresh, dried, or salted fish. About two-thirds had vegetables of some kind daily, but 6 women reported that vegetables of any kind were eaten only occasionallyh Coconut, which as coconut milk is the basishfor many curries, was usedh often. One nursing mother ate bananashdaily, and about two-thirds of these women had bananas either occasionally or frequentlyh Only five women mentioned eating other fruitsh

Three reported eating eggs daily,[1] and about two-thirds of the women had them either occasionally or frequently. Animal foods other than fish or eggs were eaten infrequently by most nursing woment

Our questions about ideas concerning foods during lactation did not uncover any firmly established traditional behavior. No food was considered harmful by a majority of informants. In response to the question as to foods which should not be eaten during lactation, however, 12 kinds of food and 4 attributes of food (sour, hot tasting,craw, fermented) were mentioned 27 times. Jackfruit, the item which occurred most frequently, was mentioned 8 times, corn, 3 times, swamp cabbage and pork, twice each; other items such as legumes, beef, poultry, egg, pineapple, and chico, once only. When asked if they disliked any foods at this time 4 women mentioned a dislike for vegetables. One mother said that cooked foods (in contrast to raw ones) were good for a lactating woman. Our question about foods craved during lactation brought little responseo

To sum up, the motherós diet during pregnancy and lactation often approximated the usual diet in Bang Chan. A few women said they craved certain foods during pregnancy and some mentioned foods disliked at that time. A number of food items and attributes of food were considered by some informants to be undesirable during pregnancy and lactation, but no item was mentioned so frequently as to be considered tabooedo During the postpartum rest period, however, a greatly restricted diet was common. Mothers apparently had no idea of special dietary needs during pregnancy or lactation.

FEEDING PRACTICES FROM BIRTH TO TWO YEARS OF AGE

This description of feeding practices is based on 256 interviews concerning 57 infants and small children. The majority of them were visited from 5 to 7 times each. Since, insofar as possible, we saw the babies at3-month intervals, changes in feeding practices will be described by 3-month periods or multiples thereofo If each visit to a child is considered as unity, the 8 age groups from birth to two years included from 17 to 41 children each with 6 of the age groups including more than 30 individualso Thus the data obtained may be assumed to provide a reasonable picture of baby feeding practices in Bang Chan, 1952-54, and of significant deviations therefromo

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1. This does not mean that the mother ate a whole egg at one mealo Frequently one or two eggs might be used to prepare food for the entire family.

Breast Feeding.

As previously noted breast feeding washthe rulehh One child in this seriesh whose motherhdied when he was 5 days old, was never breast fed but was given canned or dried milk[1] diluted with boiled water. Another infant, whose mother died of tuberculosis when the child was a year old, was weaned at 5 months because of the motherhs illness. A few breast fed infants were given cowhs milk preparations at timesh A child whose mother was a vender had cowhs milkhdaily during the mother's absence; in another instance, cow's milk was given a baby when the mother was at work in a distant field. Whenever practicable, however, mothers apparently returned to the house to nurse the baby or had it brought to the field to be fed. One woman teacher who had a baby during the school year returned to her nearby home at recess to nurse the infant. Two mothers said they gave their infants some cowhs milkhbecause they thoughththeir own milk supply was not adequateh One of these was the vender previously mentioned.

Supplementary Feeding of Infantsh

Infant feeding during the motherhs postpartum rest period has already been described (p. 12). After (2)juu (1)faj no mention was made of giving honey in water to babiesh but up to about one month of age the only other change in practice which occurredhwas that two or three mothers started to mix a little rice with the crushed or baked banana which had been started previously. As during the mother's rest period, however, a minority of infants were being given banana, i.e. most of them had nothing except water in addition tohmotherhs milkh

By 3 months of age about half of the infants were being given banana, (3)kluaj (4)nam-(4)waa, and mixing rice with it was more common. A few infants were being given rice as suchh In most instances, for infants up to 6 months of age, rice was cooked with extra water and mashedh (3)khaaw (2)piagh a preparation which was considered baby foodh Rice water with sugar was added to the soupy rice for one infant lesshthan 3 months old

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1. No fresh milk of any kind was available in Bang Chan. Water buffaloes were ordinarily not bred inhthe village and use of buffalo milk was unheard of. Among the light refreshments which could be bought at village stores, however, were coffee with condensed milk and diluted canned milkh Storekeepers stocked imported canned and dried milk including some brands designed for infant feeding. Directions for use were not in Thai, however, and the preparations actually fed to infants were often diluted more than recommended.

but additions of rice water, coconut milk, and salt[1] were more common from 3 to 6 months. A few infants less than 6 months old were given rice from the family pot cooked in the usual manner.[2] No other foods were introduced before 6 months of age.

A majority of infants from 6 to 8 1/2 months[3] of age were given ordinary rice, although for some, excess water was noto drained off and special mashed soupy rice was still given too others. Fishsoy, (4)nam (1)plaa, might be added for both salt and flavor. Several mothers said that when the baby had teeth he could begin to eat ordinary riceo At this time also the infant was given some other items which were considered as adult food (Table 2). A few were fed protein-rich foodso i.e. freshq driedq or salted fishq egg, meat, or poultry, between the sixth and ninth months. One child in this age group was given banana other than (3)kluaj (4)nam-(4)waa (kind not specified), and four infants had fruit other than banana frequently or occasionallyo Orangeq mangoq guavaq roseapple, and rambutan were mentioned according to seasono Some kinds of (2)kha-(5)nomq which included purchased crackersq biscuitsq or cookies as well as some sweet items which we would call desserts,[4] were given also, at least occasionally, to many babies over 6 months of ageo

Among infants from 9 to 11 1/2 months of age increasing use of protein-rich foods, primarily fish and egg, was noted. Fruits other than the small (4)nam-(4)waa banana and (2)kha-(5)nom were also given to more infantso A few were given vegetables before one year of ageț but none had them daily (Table 3)o

Diet During the Second Year of Life.

For most of these babies breast feeding was continued into the second year. By this time almost all were given ordinary riceq and more than half had fish daily with fresh fish being fed more often than dried or salted fisho A few babies between

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1. In Thailand rice is not salted during cooking.

2. See (3)khaaw (5)suajq glossary p. 51.

3. The nearest half month marked the dividingopoint between age groupso Thus an infant 8 months 20odays old would be considered as 8 1/2 months oldoand one 8omonths 23 days old would be considered as 9 months oldo

4. Neither such (2)kha-(5)nom nor fruit were included in the usual family meals, but school children often bought them as snacks to eat at noon recess (Hauck et al., 1958; Hauck and Hanksq 1959).

Table 2. Food Intake Other Than Milk of 32 Infants From 6 to 8 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Milk					
		Rice	Banana	Other Fruit	Fish	Egg, Meat or Poultry	(2)Kha-(5)nom
1	0						
10	1	9					1
10	2	10	10				
4	3	4	4			3	1
3	4	3	2		3	2	2
1	5	1	1	1	1		1
3	6	3	3	3	3	3	3
Total 32	D[2]	29	9		3	4	2
	F	1	6	1	1	3	3
	O		5	3	3	1	3

1. The nearest half month marked the dividing point between age groupsh Thus an infanth8 months 20 days old would be considered as 8 1/2 months old and one 8 months 23 days old would be considered as 9 months oldh

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals)h

12 and 14 1/2 months of age were given egg daily, and almosthall had egg either frequently or occasionally. About halfhthe babies of this age were fed poultry or meat occasionally, but neither of these items was common in the familyhdiets observedhin Bang Chan (Hauck et al., 1958; Hauck and Hanks, 1959)h At this age only 1 of 41 babies was given green vegetables daily, and less than one-third of them had vegetables of any kind even occasionally (Table 4).

As the children grew older they had vegetables more frequently, so that between 15 and 20 1/2 months of age almost half of the children ate vegetables at least occasionally (Tables 5 - 8)h A few two-year old children had never had green vegetables; for many, even at this age or older, vegetables of any kind were occasional rather than frequent items of diet.

Of the 23 children between 21 and 24 1/2 months of age for whom we had records, 5 were still being breast fed, and one (the orphaned child) continued to receive imported cow's milk diluted with boiled waterh All drank untreated canal or rain water according to the available supplyh All were fed rice cooked in the usual manner, but one still had soupy undrained rice at times.

Table 3. Food Intake Other Than Milk and Rice of 39 Infants From 9 to 11 1/2 months Old.[1]

Non of Infants	Non of Food Items		Number of Infants Fed Food Items Other Than Milk and Rice				
			Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
2	0						
3	1				1		2
5	2			2	4		4
12	3		11	6	11		8
13	4		13	12	13	1	13
4	5		4	4	4	4	4
Total		D[2]	16	7	5		7
39		F	9	7	13	2	10
		O	3	10	15	3	14

1. The nearest half month marked the dividing point between age groups. Thus an infant 11 months 20 days old would be considered as 11 1/2 months old and one 11 months 23 days old would be considered as 12 months old.

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals)n

Table 4. Food Intake Other Than Milk and Rice of 39 Babies[1] From 12 to 14 1/2 months Old.[2]

No. of Infants	No. of Food Items		Number of Infants Fed Food Items Other Than Milk and Rice				
			Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
2	2			1	1		2
9	3		9	5	8		5
21	4		21	20	19	4	20
7	5		7	7	7	7	7
Total		D[3]	24	4	5	1	14
39		F	12	19	19	2	12
		O	1	10	11	8	8

1. Two additional babies in this age group were still on an all milk dietn

2. See Footnote 1, Table 3.

3. See Footnote 2, Table 3.

Table 5. Food Intake Other Than Rice of 11 Weanling Babies From 15 to 17 1/2 months Old.[1]

No. of Infants	No. of Food Items		Number of Infants Fed Food Items Other Than Rice				
			Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
1	2		1	1			
6	4		6	6	6		6
4	5		4	4	4	4	4
Total 11		D[2]	10	2	3	1	3
		F		5	7		2
		O	1	4		3	5

1. The nearest half month marked the dividing point between age groups. Thus an infant 17 months 20 days old would be considered as 17 1/2 months old and one 17 months 23 days old would be considered as 18 months old.

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals).

Table 6. Food Intake Other Than Milk and Rice of 30 Babies 15 to 17 1/2 months Old.[1]

No. of Infants	No. of Food Items		Number of Infants Fed Food Items Other Than Milk and Rice				
			Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
1	1		1				
1	2		1				1
3	3		3	3	1		2
12	4		12	12	12	1	11
13	5		13	13	13	13	13
Total 30		D[2]	23	2	2	1	10
		F	4	11	16	2	9
		O	3	15	8	11	8

1. See Footnote 1, Table 5.

2. See Footnote 2, Table 5.

Table 7. Food Intake Other Than Rice of 14 Weanling Babies From 18 to 20 1/2 months Old.[1]

No. of Infants	No. of Food Items		Number of Infants Fed Food Items Other Than Rice			
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
2	3	2		2		2
4	4	4	3	4	1	4
8	5	8	8	8	8	8
Total 14	D[2]	11	2	1	2	8
	F	3	6	8	1	5
	O		3	5	6	1

1. The nearest half month marked the dividing point between age groups. Thus an infant 20 months 20 days old would be considered as 20 1/2 months old and one 20 months 23 days old would be considered as 21 months old.

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals).

Table 8. Food Intake Other Than Milk and Rice of 18 Babies From 18 to 20 1/2 months Old.[1]

No. of Infants	No. of Food Items		Number ofoInfants Fed Food Items Other Than Milk and Rice			
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
3	3	3	2	1		3
9	4	9	9	9		9
6	5	6	6	6	6	6
Total 18	D[2]	14	1	3		7
	F	3	11	5		7
	O	1	5	8	6	4

1. See Footnote 1, Table 7.

2. See Footnote 2, Table 7.

Table 9. Food Intake Other Than Rice of 17 Weanling Babies From 21 to 24 1/2 months Old.[1]

No. of Infants	No. of Food Items		Number of Infants Fed Foodh Items Other Than Rice				
			Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
6	4		6	6	6	1	5
11	5		11	11	11	11	11
Total		D[2]	16	1	2	3	7
17		F	1	8	6	1	3
		O		8	9	8	6

1. The nearest half month marked the dividing point between age groupsh Thus an infant 24 months 20 days old would be considered as 24 1/2 months old and one 24 months 23 days old would be considered as 25 months old.

2.h D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervalhs).

Table 10. Food Intake Other Than Milk and Rice of 6 Babies From 21 to 24 1/2 months Old.[1]

Noq of Infants	No. of Food Items		Number of Infants Fed Food Items Other Than Milk and Rice				
			Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
6	6		6	6	6	6	6
Total		D[2]	5				3
6		F	1	4	3		2
		O		2	3	6	1

1. See Footnote 1, Table 9.

2. See Footnote 2, Table 9.

Fish, fresh, dried, or salted, depending on the family fare, was a regular part of their diet (Tables 9, 10). One had egg daily, and 10, frequently; but for more than half of them egg, as well as meat or poultry, was an occasional item of diet. All were fed (2)kha-(5)nom, and almost half had something in this class of foods daily. Only three had green or other vegetables daily and 5 never ate them. Bananas of the (4)nam-(4)waa variety were eaten by all, but only one had banana daily while more than half had them only occasionally. Four were sometimes given bananas other than (4)nam-(4)waa, the variety which was considered safe for infants and invalids. Two had never had other fruit, but most children of this age were occasionally given other seasonal fruit. The variety of foods other than milk given to these children did not appear to depend on whether or not they had been weaned (Tables 5 - 10).

Weaning.

Some of the children in this series had been weaned before our observations were started, and 19 had not been weaned when last visited. For 30 children the period of observation included weaning (Table 11), and in most cases enough records were obtained so that the effect, if any, of weaning on the weight curve could be ascertained.

Table 11. Age at Weaning for 37 Babies and Number for Whom Weight Records Before and After Weaning were Obtained, Bang Chan, 1952-54.

Approximate Age At Weaning (months)[1]	Number of Babies	
	Total	Weighed Before And After Weaning
5	1	0
9	1	1
11	1	1
12	8	4
13 - 14	5	5
16 - 17	2	2
18 - 19	8	7
20 - 22	7	6
25	2	2
28	1	1
36	1	1
Total	37	30

1. Because of the method of choosing children for study, the majority of those observed were under two years of age. We have no basis for judging what proportion of children in Bang Chan were breast fed beyond two years of aget

In Bang Chan infants less than a year old were seldom weaned. Of 3 such cases we encountered, the mother of one was ill with tuberculosis, and the other two mothers were again pregnant. Common answers to the question, "When should a baby be weaned?", were, "When it is a year old", or "At 1 1/2 years", or "When the mother is pregnant again." Mothers commonly nursed one infant until 3 to 7 months pregnant with the next. More than half of the children who were nursed longer than 18 months had no younger sibling during the period of this study.

Of 32 mothers who described the weaning procedure, 13 painted the nipples with boraphed or other bitter substance (lime or aloe), but an equal number said they did nothing. Six mothers gave other food instead of breast milk. In 4 cases cow's milk[1] was given; in one, bananas and (2)kha-(5)nom; and in one instance the food substituted was not specified.

Weaning in Bang Chan usually meant the end of milk feeding, but 5 babies in this series were given cow's milk feedings after weaning. These included the infant who was weaned at 5 months because of the mother's illness and two other who were weaned because of a pregnancy. The child who had been given cow's milk when the mother was away vending continued to have cow's milk at night, after weaning.

Beliefs About Foods for Babies.

Foods "Good For" Or "Not Good For" Babies. - In addition to asking what foods were given the baby, we asked mothers (or other informants) what foods they considered "good for" or "not good for" the baby. Informants were not prompted by asking about specific foods. The most usual answer was that the informant did not know or did not consider any food either especially suitable or unsuitable. Only 6 informants mentioned foods considered good for the baby (Table 12). One of these named 3 such foods: egg, fish, and vegetables.

A larger number of informants reported that one or more foods were not good for a baby, but in a majority of instances (30 of 50 replies) the informant did not mention any food in this category. In all, 15 foods and 2 characteristics of foods

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1. No fresh milk of any kind was available in Bang Chan. Water buffaloes were ordinarily not bred in the village, and use of buffalo milk was unheard of. Among the light refreshments which could be bought at village stores, however, were coffee with condensed milk and diluted canned milk. Storekeepers stocked imported canned and dried milk including some brands designed for infant feeding. Directions for use were not in Thai, however, and the preparations actually fed to infants were often diluted more than recommended.

("hot tasting" and "hard") were mentioned 39 times (Table 13) with jackfruit and chico being mentioned in connection with the same baby at both 6 and 9 months of age.

Table 12. Foods Considered Good for Babies.

Food	Number of Informants	Age of Baby at Time of Inquiry (months)
Rice	3	3, 15, 36
Egg	2	6, 15
Fish	2	15, 16
Vegetables	1	15

There was no indication that any food was considered harmful by most mothers. Although thenlist of foods considered not good for babies was considerably longer than the list of foods considered good for them, the item which occurred most frequently, jackfruit, was mentioned by only 6 informants. Eggs, vegetables, and fish were considered by some as good for the baby and by others as harmful (Tables 12 and 13).

Table 13. Foods Considered Not Good for Babies.

Food	Number of Informants	Age of Baby at Time of Inquiry (months)
Jackfruit	6	5, 6 and 9[1], 11, 18, 21, 22
"Hot tasting" foods	6	12, 14, 15, 24, 24, 27
Chico	4	6 and 9[1], 11, 21, 22
Egg	3	7, 11, 27
Sugar	3	9, 11, 12
Banana (ordinary "fragrant" type)	2	21, 22
Hard things	2	6, 10
Glutinous rice	2	9, 11
Fish	1	9
Fresh fish	1	15
Vegetables	1	6
Mango	1	6
Raw banana	1	6
Corn	1	18
Guava	1	18
Orange	1	15
"Ice"[2]	1	36

1. Mentioned for same child at both 6 and 9 months.

2. Either a frozen syrup or syrup over shaved ice.

Reasons were seldom advanced for considering certain foods unsuitable for mothers or children. During pregnancy the hot-tasting foods, i.e. those made with chili, were said by one informant to injure the baby's complexion. When asked at what age a child could have adult food, mothers might say at one or two years but often specified without giving a reason, that they could have anything but the "hot-tasting" foods (foods seasoned with chili). Two mothers said the child could have "hot tastes" at one year, whereas one said not until the child was 3 years old. A majority did not specifically mention hot tasting foods either to include or to exclude them.

A reason given for omitting jackfruit from the diet during lactation was that it would cause diarrhea in the baby. One informant said that if a mother nursing a young baby 1 or 2 months old ate fresh vegetables, the baby would have diarrhea. Some informants said the "fragranth banana", (3)kluaj (5)hauaum[1], caused constipation in infants, others that it caused diarrhea, whether eaten directly by the infant or by the mother.

The belief that eggs would cause dental caries and should therefore be omitted from children's diets was expressed by the mother in a poorly nourished family of low economic status.

Opinions varied as to when children could be given "adult food". This was often, but not always, the age considered appropriate for weaning. As the question was worded it apparently implied that the child "could eat food as prepared for adults in the family" and did not necessarily exclude breast feeding, since children who "could have adult food" might still be nursing. The age at which a child could have adult food was sometimes related to stage of maturity as "when he can sit", "when he has teeth", or "when he can say (1)plaa (fish)".

Traditional and Modern Concepts of Rice Versus "With-Rice" in the Diet - Rice is not only the basis of the adult diet in Thailand, but it has traditionally been regarded as the strength giving food par excellence. A portion of Chutima's (1939) description of the "old system" of diet follows:

> "Our children and young women are forbidden by ancient doctrine from eating any fair quantity of animal products, but must eat plenty of rice which is considered as the only true food, the others being only appetizers. And to stimulate the palate, large quantities of hot and irritating condiments (chilies and peppers principally) are consumed at every meal.

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1. The type of banana most familiar to people in the U.S.A.

Some vegetables, boiled or raw, are also included, but in small quantities in spite of abundant supply."

Note that not only has rice been considered much more important as food than "with-rice"[1], but that the diet was more limited for children and young women than for men. The Food and Drug Division of the Ministry of Public Health in Thailand has been trying to encourage people to eat more "with-rice" and less rice. The few comments we heard in relation to rice versus "with-rice" illustrate both the old and the new ideas. One informant stated that only rice can make children fat and that the "hot tasting" foods help them to eat more rice. Another commented that rice makes children strong, and "with-rice" makes them weak. Another, a mother of seven children, said that if babies were given too much "with-rice" they would be potbellied. The more modern view was expressed by an informant who said that a certain child ate only rice with fish and was weak. He refused vegetables and banana. One affluent farmer, an elderly man whose orphaned grandchild was being raised on cow's milk[2], expressed the opinion that the ancient belief was based on thrift. He said that thrifty people did not want to spend much on a baby, therefore, they said that if a child ate too much "with-rice" he would be potbellied but thin in the upper part of the body and that eating eggs would cause dental caries. This grandfather said that he believed the truth to be just the opposite, but that good things were expensive. As an illustration of the idea that thrift was the basis of restriction of "with-rice", one young mother said that an egg was regarded as equivalent to one (1)plaa (1)thuu (a fish), and was enough for two persons. Sometimes one egg would serve an entire family. She said that a child would be punished if he ate a whole egg at a meal.

Summary of Infant Feeding Practices in Bang Chan with Some Suggestions for Improvement.

To sum up the information obtained on baby feeding in Bang Chan, breast feeding was the rule. Some babies were nursed for two years or longer although about two-thirds of those we observed through the weaning period had been weaned by 18 or 19 months of age. Aside from honey which was given with medicine or hot water to newborn babies for a few days only, crushed banana of the (4)nam-(4)waa variety was usually the earliest dietary supplement. By 3 months of age about half the infants were being given banana, sometimes crushed with rice. Between

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1. In Thai the general term meaning "to eat" is translated literally "to eat rice." Food items are divided into two classes: rice and "with-rice."

2. See Footnote, page 25.

3 and 6 months soupyerice was a common addition to the infant's diet, and after the first teeth appeared many had rice from the family pote Between 6 and 9 months, also, fish was given regularly to many babies and egg at least occasionally. Crackers, cookies, and various items designated as (2)kha-(5)nom were frequent additions at this age.

Seasonal fruit such as mango and orange was given to some infants from 6 months on, but most children had fruits other thannthe (4)nam-(4)waa banana infrequently even at two years of agen As the feeding of rice increased, banana was given less often, so that for the 2-year old child even banana was eaten only occasionally. A minority of babies were fed vegetables by one year of age, and some had not begun to eat them by two yearsn Only about half the children from 2 to 4 1/2 years old had vegetables frequently.

Avoidance of hot tastesn rather than reluctance to give vegetablesn may have been responsible for late introduction of vegetables into the diet of many children. In BangnChan vegetables were often combined with other foodsn as in curriesn They were usually added toward the end of the cooking time after the mixture had been seasonedn Vegetables from such a "hot dish" would not be offered to a small child unless the parents considered him old enough to eat "hot-tasting" foods. Among the mild "with-rice" dishes were vegetables panned with a small amount of fat and seasonings other than chili, as well asnvegetables cooked in coconut milk or in water (Hauck et al., 1958; Hauck and Hanks, 1959)n In this connection the suggestion of a Thai coworker that one might encourage eating more vegetables by discouraging the use of "hot" dishes seems promising, since a larger amount of mild than of "hot" "with-rice" food is eaten at one time. To promote more frequentn and earlier, feeding of vegetables to babiesn one would need to encourage either more frequent preparation of mild "with-rice" dishes containing vegetables or special preparations of vegetables for the baby. The latter is rather impractical when foods are cooked one at a time over the same fire as in Bang Chan.

Perhaps one reason why most infants in Bang Chan had fish daily after 6 or 7 months of age is that in making curries fish was often cooked in a little fat or coconut milk before seasonings were added. Thusn a little fish could then be set aside for the baby before chili and other spices went into the potn (Noten also, that rice and fish were the foods considered safe to eat during (2)juu (1)faj by all mothers interviewed). Changes in foodnpreparation suggested for improvement of the family diet in generaln(Hauck, 1958) couldnautomatically help to improve the feeding of young children who are gradually introduced to adult foodsn At the same time, a better family diet would probably help to improve the quality and quantity of mother's milk, since during lactation mothers tendednto eat as usual. In deciding whether the more effective approach wouldnbe through teaching

better nutrition for all family members or whether to concentrate on the feeding of children or other vulnerable groups, the values of the society should be considered. The importance of a suitable variety of food for health needs to be taught to adults as well as children in Bang Chan. The concept that good choice of food is important in pregnancy and lactation and for the health and growth of children seemed to be entirely absent. Since few believed certain foods to be harmful at these times, however, teaching how to choose foods for health should be easier in Bang Chan than it is in areas where positive taboos are common.

Behavior different from the traditional one may sometimes lead the way to changed practices among those who observe or hear about it. For this reason, in certain instances an informant who had ventured to deviate from the traditional practice has been identified in this record. Thus, we noted that in a number of ways the women school teachers and the wife of a man teacher deviated from the traditional behavior in Bang Chan. For example, a school teacher's wife used the hot ashes chamber after her fifth child rather than lying by the fire. She was one of two women informants who "ate all kinds of food" at this time when most women in the community restricted their diets very markedly. She did not consider taking the baby out into the sunshine harmful; indeed, she believed it would make the child stronger. This same mother was 1 of 4 in our series who had taken the baby to be vaccinated against smallpox. She and three women school teachers were among those who continued to give their babies boiled water to drink much longer than was customary in Bang Chan. The one person who suggested a specific food (eggs) as being good for a woman to eat during pregnancy was a school teacher. The twotwomen who planned to go to the Minburi Health Center for delivery were school teachers. For lack of time after labor began they did not carry out their plans; but the fact that they intended to do, by choice, what was usually the last resort when labor proved long or difficult, may be significant.

Along with these departures from traditional ways and acceptance of some "modern" practices, the same persons might cling to other sorts of traditional behavior. The wife of a school teacher for example, though she thought that taking the baby into the sunshine might be favorable rather than harmful, said that if the baby were to be out very long she would cover its head with a beret to avoid bringing "cold" into the baby. This same mother took her child to the Minburi Health Center for treatment for a skin infection, but when the condition did not clear up immediately after modern therapy was begun, she took the child to a traditional doctor who prepared a decoction of herbs with which she treated the baby.

The behavior of respected persons, such as some of the school teachers, should be influential in helping to bring about

desirable changes in Bang Chan. An important point, however, is that leaders should understand, insofar as possible, the reasons behind the "modern" ways and not accept them merely because they are considered modern. Without adequate understanding traditional behavior which has served a useful purpose in protecting the people's health might be abandoned, or a half-understood "modern" way substituted to their hazard. For example, a popular traditional midwife said she knew that water was not boiled for mothers and babies in the hospitals in Bangkok, and the wife of a school teacher said she did not think use of boiled water was really necessary during (2)juu (1)faj. Traditionally, heat has been considered beneficial at this time. If this idea were extended to include an understanding of the value of boiling water to destroy harmful microorganisms and parasites, the traditional practice might be confirmed and even extended for the protection of other family members. If a sanitary water supply eventually becomes available in Bang Chan[1], precautions required to keep it so might be thought of as analogous to boiling of water; or chemical purification might be understood by the peasant as a modern way of conferring on water the virtues which boiling conferred when the "old way" was followed. Improvement in health and nutrition in Bang Chan must, of course, be seen as a long-time goal dependent on continuing education.

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1. In 1952-54 there were no wells in the area, and the problem of planning for a sanitary water supply when the plain is flooded for a part of each year is not an easy one.

GROWTH IN HEIGHT AND WEIGHT OF INFANTS AND YOUNG CHILDREN

Evidence on growth in height and weight of Thai is scanty. So far as we have been able to learn, all available studies have been cross-sectional. We, therefore, undertook, in the limited time available, to make longitudinal studies of growth of infants and small children and elementary school children in Bang Chan. Observations on the latter were summarized by Thorangkul (1957) and those of infants and small children, by Smith (1958).

In general Thai children of elementary school age are shorter and weigh less than Western children of the same age. Heights of children in the Bang Chan elementary school were, on the average, less than mean heights for Thai children given by Dr. Yong Chutima (1939), and they were much below mean heights at various ages from charts (class II) in use at the Department of School Hygiene, Bangkok. Mean heights of adult men and women in Bang Chan were slightly below those recorded by other observers who have measuredngroups of Thai men and women (Hauck, 1956). Without further study one cannot say whether the short stature of Thai as compared to Western peoples is due to inheritance, environment, or both. Nor do we know why school age children and adults in the rice producing village of Bang Chan were, on the average, somewhat shorter than their counterparts in Bangkok only 20 miles away.

Thorangkul (1957) found that although children 7 to 14 years of age increased in height in successive 3-month intervals, a large proportion of them failed to gain weight or even lost at times and that such failure to gain occurred in more children during the dry season than during the wet season. The reason for this was not apparent from our observations. Two possible explanations are: 1) use of untreated canal water may lead to heavier infestation with intestinal parasites in the dry season and 2) leafy vegetables are almost lacking, and other vegetables are in short supply at this time. One would expect the temporary shortage of vegetables to be reflected in growth failure only when the diet is borderline in respect to some nutrients as it appears to be in Bang Chan (Hauck et al., 1958; Hauck and Sudsaneh, 1959). Either of the possible causes suggested might affect the nutritional state of other family members as well as elementary school children. All those drinking canal water and eating "adult foods" could be affected directly, whereas infants who are still largely breast fed might be affected indirectly through the quantity and quality of mother's milk available to them.

In this section observations on the growth in height and weight of infants and small children in Bang Chan are presented.

Table 14. Ages of Infants and Young Children at First and Last Measurements[1], Bang Chan, Thailand, 1952-54.

Age at First Measurement	Age at Last Measurement	Number of Children		
		Total	Boys	Girls
months	monthso			
under 1[2]	13-18	16	5	11
1-3	16-21	12	8	4
4-5	20-22	5	4	1
7-9	23-27	4	2	2
11-12	22-28	6	4	2
13-18	29-35[3]	6	0	6
19-24	36-40	10	3	7
25-29	40-45	5	3	2
31-35	42-51	4	4	0
36-43	53-60	3	3	0
		71	36	35

1. In addition to these listed nine children were measured once or twice but were not followed longero

2. Weights and recumbent lengths for infants under 1 month are not included inothis report because of varying ages from one day onward, at which the initial observations were made.

3. Except for one child who was measured over a relatively short periodo

Methods.

All measurements of infants and children were made by one or more members of the research group. Equipment and procedures are described in the Appendix (p. 58).

In all, observations were made on 80 babies. For some of these, however, only one or two measurements were obtained. Such records were inadequate for most purposes of this study. Fairly complete sets of measurements were obtained for 71 babies through a total of 449 visits (Table 14). Since our aim was to obtain as much information as possible about babies from birth onward, the larger numbers of children were in the lower age ranges.

Nine babies were measured once or twice but were not followed longer because of removal from the village, inability of a mentally subnormal mother to cooperate, death (2 cases), and in one instance, reluctance to cooperate on the part of the mother of an illegitimate baby.

The investigation covered a period of 18 months, and visits were made at intervals of about 3 months, thus, most of the children were measured 6 or 7 times (Table 15).

Table 15. Number of Times Children Were Weighed and Measured, Bang Chan, Thailand, 1952-54.

Number of Measurements	Number of Children
3[1]	3
4	2
5[1]	6
6[2]	21
7	36
8	3

1. An additional measurement of weight but not of height was made on one child.

2. An additional measurement of weight but not height was made on two children.

Sometimes mother and baby were not at home when the scheduled visit was made. If the household was remote from headquarters it might not be possible to return soon without neglecting other equally urgent work. In other cases the child was visited and the food intake recorded, but the child was unwilling to allow himself to be measured; occasionally the child was

asleep, and the mother was reluctant to wake him. Thus, for some children only three or four measurements were obtained.

The measurements of height and weight of each child were tabulated byhage in months at observation.[1] A child was considered to be the age at his last month's birthday unless he was within 7 days of the next month's birthday. For example, a child who was measured at 2 months 25 days was considered to be 3 months of age, whereas ahchild who was measured at 2 months 20 days was considered to be 2 months old at the time of measuring.

Results.

Growth in Height and Weight Compared to Children Attending Well Baby Clinics. - The mean, median, and range of heighthand weight of children measured at 1 monthh 3 months, 6 monthsh 9 months of age, and so on,hwere determined (Tables 16 and 17). These figures include data obtained for all children who were measured at any of the selected ages but not weights and measures made at intervening ages. No marked difference was noted between mean and median values for height andhweight. At almost all ages the mean and median values for height andhweight of boys were greater than those for girls.

For comparison with these observations,honly two reports on height and weight of Thai infants have come to our notice. Both of these dealt with infants and young children attending well baby clinics in Bangkok.

Over a period of 5 years, Dr. Montri Mongcolsamai (1939) collected data on height and weight of infants and children who came to the Well Baby Clinic at the Siriraj Hospital. These were described as normal children free from disease and ranging in age from 1 day to 6 years. Most of the children were Thaih most were from Bangkokh and most had been born in the Siriraj Hospital. In all,h2664 children were observed; 3006 measurements of height and 3570 measurements of weight were obtained.

Dr. Montri (1939) grouped the data according to age and sex, reporting mean values for height and weight of children under 1 year of age at monthlyhintervals and of children over 1 year of age at intervals of 6 monthsh For example, weights of all male infants who were 1 month old but younger than 2 months were averaged, also, weights of all male children who were 1 year old but younger than 1 1/2 years were averaged. Average weights and lengths of newborn infants and of infants under 1 month of age were included.

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1. The height and weight of each child at each observation were reported by Smith (1958).

Table 16t Mean, Median, and Range of Heights and Weights of Male Infants and Young Children Who Were Measured at Selected Ages, Bang Chan, Thailand, 1952-54.

Age	No.	Height			Weight		
		Mean	Medt	Range	Mean	Med.	Range
		cm.	cm.	cm.	kg.	kg.	kg.
1 mo.	5	54.9	54.5	54.0-57.5	3.3	4.5	3.8- 5.25
3 mo.	9	59.4	59.5	49.5-64t5	6.1	5.5	5.0- 8.35
6 mo.	10[1]	64.8	65.8	60.0-69t0	7.2	7.0	6.0- 8.5
9 mo.	10	68.2	68.3	65.0-73.0	7.6	7.5	6.9- 8.5
1 yr.	11	70.9	70.5	65.0-77t0	8.2	8.0	7.0-11.0
1 yr. 3 mo.	12	73.3	74.0	70.0-76t0	8.6	8.5	8.0- 9.75
1 yr. 6 mo.	9	76.7	76.5	74.0-80t0	9.3	9.0	8.0-10.5
1 yr. 9 mo.	6	79.0	80.3	73.5-81.0	9.7	9.8	7.5-11.0
2 yr.	6	79.1	80.3	74.5-82t5	10.1	10.5	8.0-11t5
2 yr. 3 mo.	5	81.3	82.0	76.0-85.0	11.2	12.0	8.5-13t5
2 yr. 6 mot	3	84.0	83.5	80.5-88.0	10.7	11.0	10.0-11.0
2 yr. 9 mot	3	86t2	85.5	84.0-89.0	11.2	11.5	10.0-12t0
3 yr.	7	87.9	87.5	85.0-92t0	12.0	12.0	10.5-13t5
3 yr. 3 mot	6	88.0	87.8	85.0-92t5	12.0	11.8	11.0-13t75
3 yr. 6 mot	7	89.8	89.5	87.0-95t0	12.5	12.5	11.0-14.5
3 yrt 9 mo.	4	92.3	92t5	90.0-94t0	12.9	13.0	12.0-13.5
4 yr.	3	94.0	94.5	91.5-96t0	14.2	14.5	13.0-15.0
4 yr. 3 mo.	4	95.9	95.5	93.5-99.0	14.8	15.0	13.0-16t0

1. An additional child was weighed but height was not measured.

Table 17. Mean, Median, and Range of Heights and Weights of Female Infants and Young Children Who Were Measured at Selected Ages, Bang Chan, Thailand, 1952-54

Age	No.	Height			Weight		
		Mean	Median	Range	Mean	Median	Range
		cm.	cm.	cm.	kg.	kg.	kg.
1 mo.	9	53.1	52.0	49.0-59.0	3.9	3.75	3.35- 4.45
3 mo.	10	59.1	59.3	54.0-64.5	5.7	5.4	4.45- 7.0
6 mo.	9	62.8	62.5	57.5-69.0	6.6	6.5	4.8 - 8.0
9 mo.	11	65.3	64.5	58.0-73.0	7.0	7.0	5.35- 8.5
1 yr.	12	69.5	68.7	63.0-76.0	8.0	7.8	6.0 -11.0
1 yr. 3 mo.	11	72.1	71.0	68.0-80.5	8.2	7.5	7.0 -10.5
1 yr. 6 mo.	11	72.6	72.5	67.5-83.0	8.2	8.5	4.5 -11.0
1 yr. 9 mo.	7	77.6	75.0	74.0-86.5	9.7	9.0	8.0 -12.0
2 yr.	9	79.2	79.5	73.0-85.0	9.9	9.5	7.5 -13.0
2 yr. 3 mo.	8	78.4	78.3	74.0-82.5	9.3	9.5	7.5 -10.5
2 yr. 6 mo.	6	80.7	81.3	76.0-84.0	10.0	10.0	9.0 -11.0
2 yr. 9 mo.	6	83.4	83.0	78.5-88.0	11.3	11.8	9.7 -12.0
3 yr.	6	88.1	88.0	84.5-92.0	11.8	11.8	10.0 -14.0
3 yr. 3 mo.	3	87.3	86.5	85.0-90.5	11.5	11.5	11.0 -12.0
3 yr. 6 mo.	2	87.5	87.5	86.5-88.5	12.0	12.0	11.0 -13.0
3 yr. 9 mo.	1	87.5			14.0		

In some age groups fairly large numbers of children were observed and in other groups relatively few. None of the groups up to 4 1/2 years of age with whom the children in this series could be compared included fewer than 30 individuals. The numbers of boys and girls measured at each age were about the same.

Drn Amara Chandrapanond (1957) reported the mean heights and weights of 20 babies who were weighed and measured at monthly intervals over a period of a year. She did not report values for boys and girls separately, but, in general, at each age these fell between those for males and females as reported by Drn Montri (1939).

In figure 1 the median heights of boys and girls in Bang Chan together with the number of individuals who were measured at 3, 6, 9, 12, 15, 18, or 21 months are shown in comparison to the height curves constructed from values reported by Drn Montri (1939). Corresponding median weights are shown in figure 2. Although the groups are small, the tendency for both height and weight of young children in Bang Chan to be below that of children attending a well baby clinic in Bangkok is clear.

One should note, however, that Drn Montri characterized the children he observed as "free from disease", whereas some of the children of Bang Chan had colds, skin infections, or other minor disorders which might have affected their weights. Such disorders are very common, and we do not know whether or not they disqualified children attending the Well Baby Clinic from inclusion in the series for which heights and weights were reported.

Graphs of height-age and weight-age were plotted for each child in this study and for small groups of children who were observed regularly over a year or so at the same ages.

Most of the children increased in height in a fairly regular fashion, the slopes of their height curves being about the same as the curve drawn from Drn Montri's[1] values, although there were individual variations in this. The height curves of many more children of Bang Chan were below than were above the curve drawn to Drn Montri's values. Of the 35 girls measured, the height curves of 6 were above, 6 were about the same as, and 23 were below the curve drawn to Drn Montri's values for girls. Of the 36 boys measured, the height curves of 9 were

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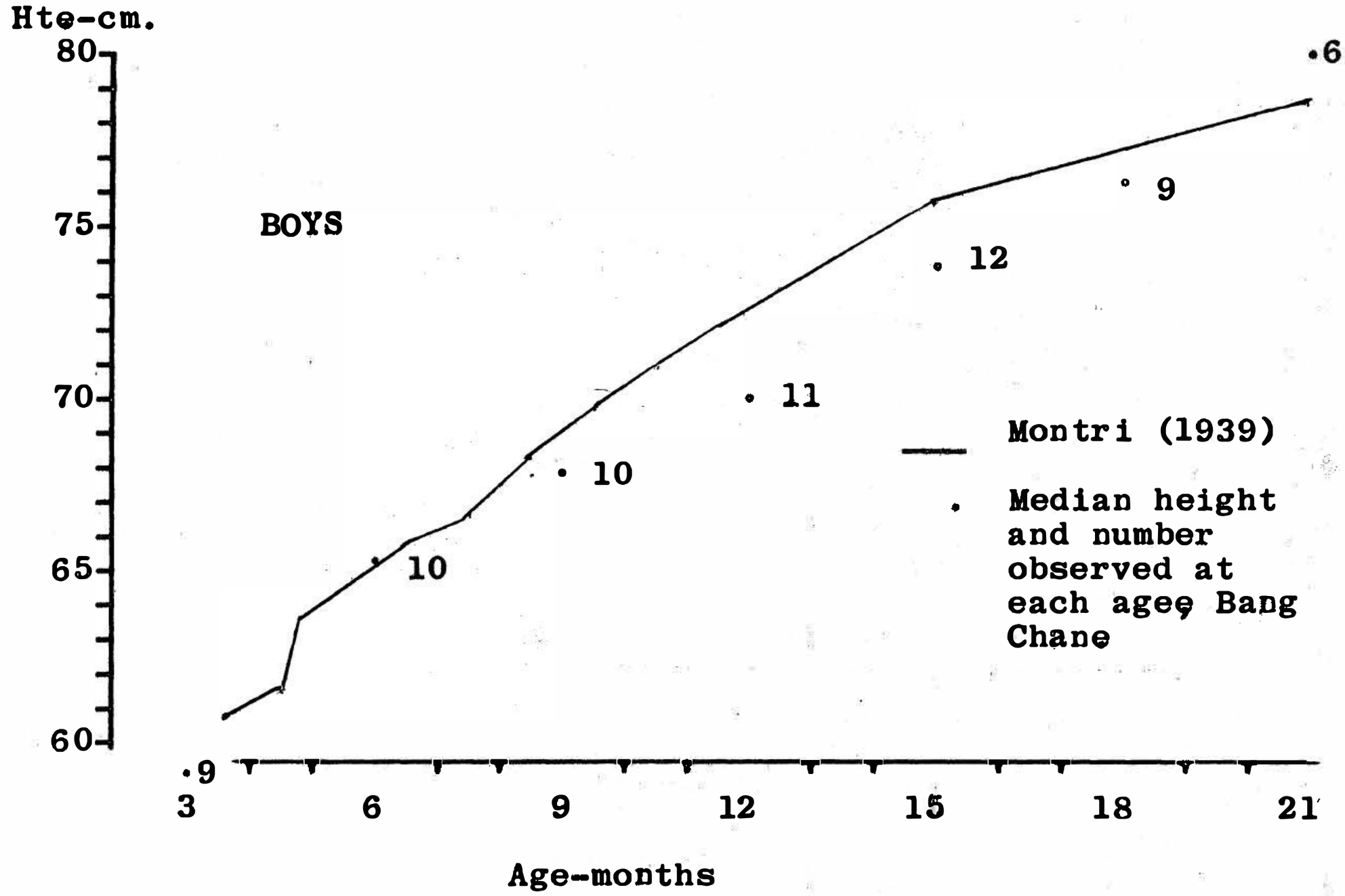
1. Mean values reported by Drn Montri were plotted at 1-month intervals for the first 11 months, then at the midpoint of the intervals he reported. For example, measurements reported for children 1 to 1 1/2 years of age were plotted at 1 year 3 months.



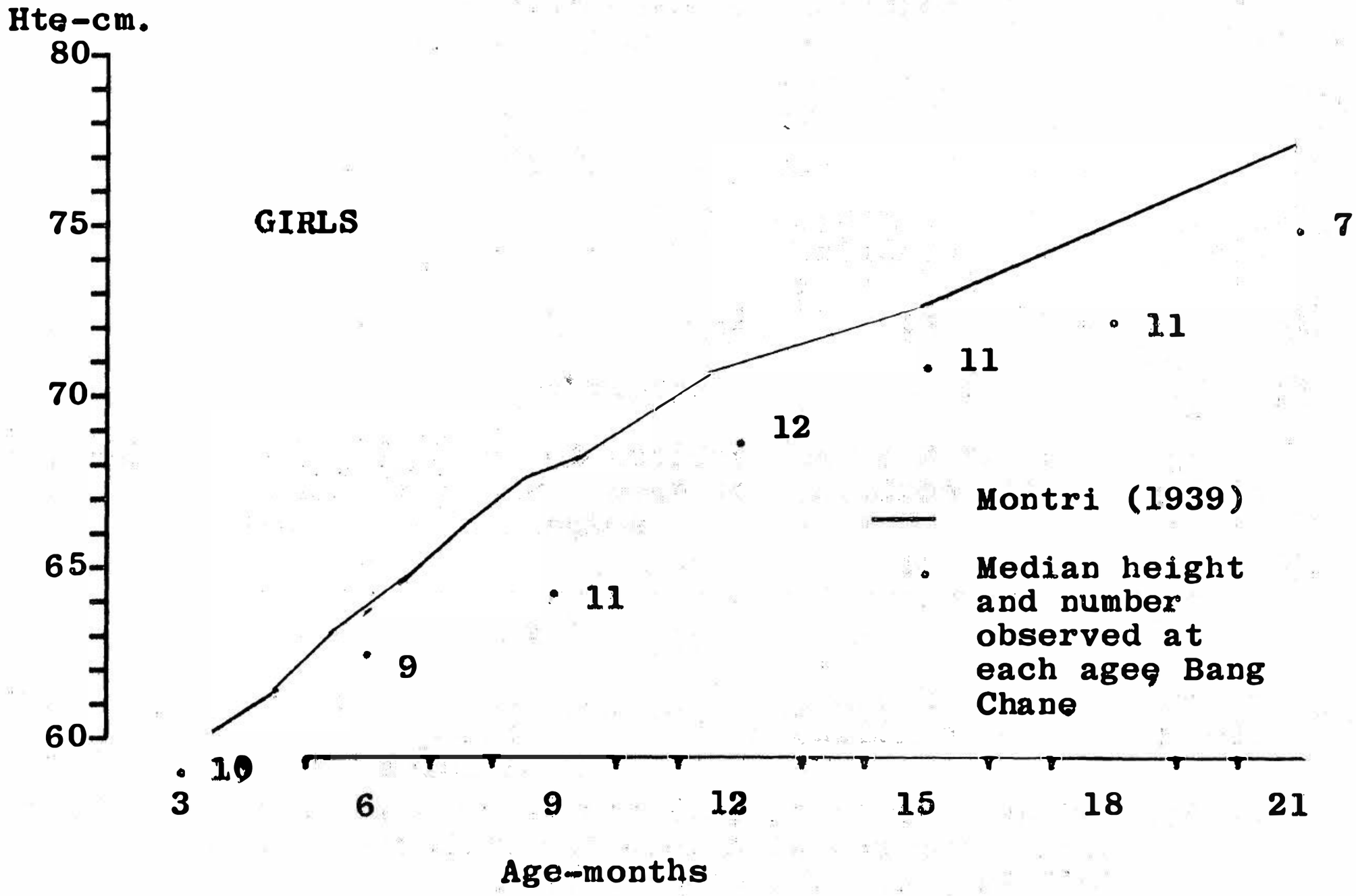


Figure 1. Median Heights of Children Under 2 Years of Age, Bang Chan, Compared to Mean for Children Attending Well Baby Clinic, Bangkok.

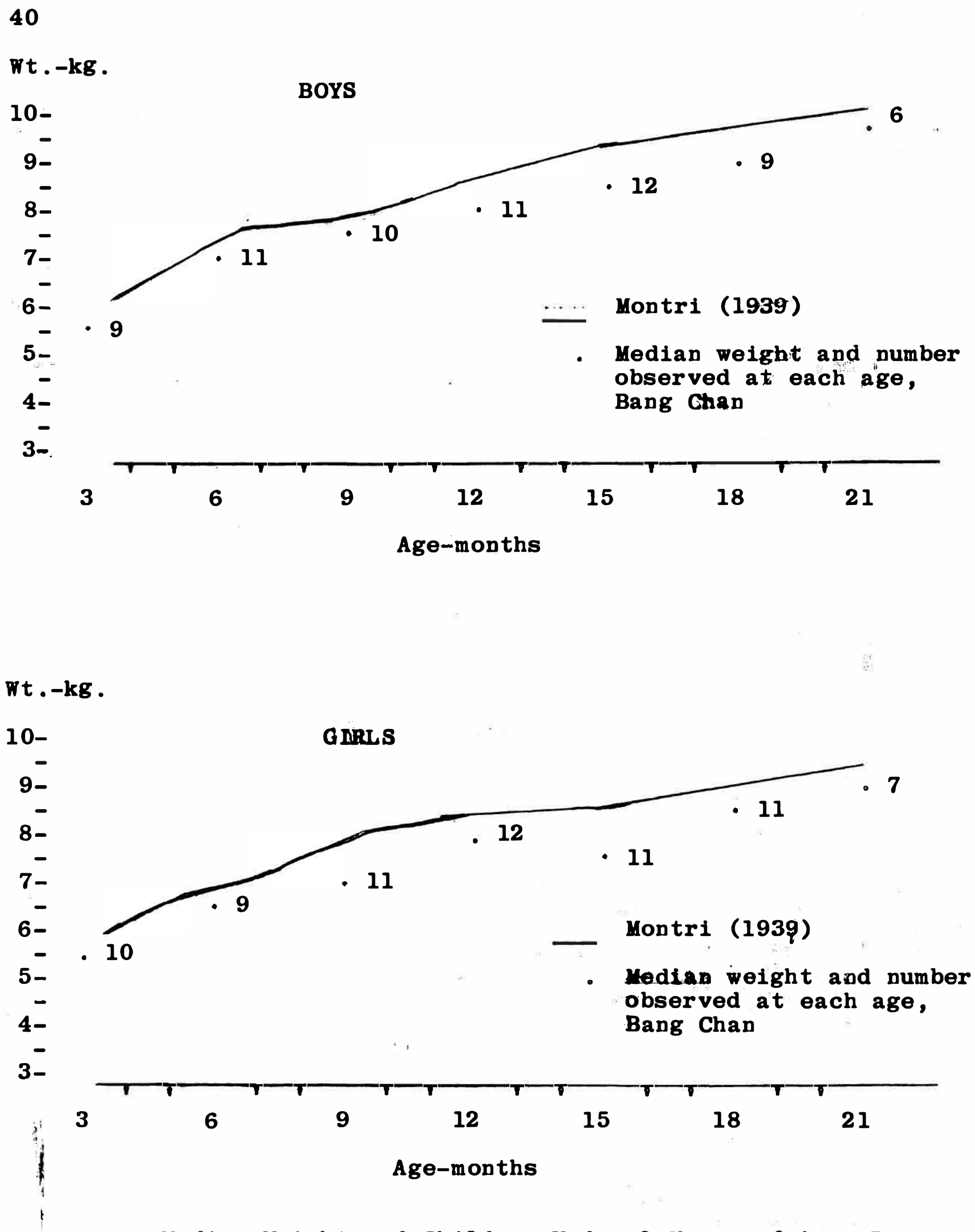


Figure 2. Median Weights of Children Under 2 Years of Age, Bang Chan, Compared With Mean for Children Attending Well Baby Clinic, Bangkok.

above, 12 were abouttthe same as, and 15 were below the curve drawn to Dr. Montri's values for boys.

Mean heights and weights of groups of children who were observed regularly at 3-month intervals, at the same ages, were determinedt The numbers in these groups were small because of difficulties encountered in collecting data precisely according to plan, but curves could be constructed for some such groups covering periods up to 12 monthst Thesetwere compared to those based on Dr. Montri's values. The curves of mean height for such small groups were fairly smooth with slopestsimilar to but below the curve drawn to Dr. Montrifs datat

For the younger groups of children in Bang Chan, curves for mean weights were generally below those drawn totDr. Montri's values.t Although the groups under 1 year of age were, on the average, about 1 week younger than the children observed by Dr. Montri, adjustment[1] did not eradicate the differencet Differences between mean weights for groups of children 15 months of age and older, in this series and in Dr. Montri's, were less consistent than fortthe younger children t

Many studies on weight of infants in the tropics indicate that weight gain during the first 6 months or so of life is comparable to that oftinfants in Europetand America. After 6 months of age,thowever, the weight curves become flattened (Jelliffe, 1955; Falkner et al., 1958). Both Dr. Montri (1939) and Dr. Amara (1957) noted thisttendency in the weights of the Thai infants they studied. Dr. Montri (1939) compared the weights of the Thai children he observed with values reported for Japanese childrent He found that up to 6 months of age Thai children weighed as much as Japanese children but that after this age they weighed less. Dr. Amara (1957) compared the weights of the infants she observed with those of American babies and found that after 4 months of age the Thai infants gained weight more slowly. Both of these observers expressed the opinion that Thai babies gained weight more slowly as they grew older because their diets were inadequatet

In general, Thai children tare short and light as compared to children in the U.S.A. In the Bang Chan group, fortexample, at 3 and 6 months the median tweights fortmale infants approximated the 25th percentile of male infants as reported by Stuart and Stevenson (1950). At 9 months, however,t the median weight was

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1. Dr. Montri calculatedtthat boys 3tto 6 months old gained, on the average, 23 grams per day and that girls gained 22 grams per day; from 6 to 9 months thetfigures are 7.3 and 7.8; and from 9 to 12 months they are 7.4 and 7.6 grams, for boys and girls respectively. These values were calculated for a week and added to the mean weights of the children of Bang Chan to find out if the difference could be accounted for in this wayt

about the same as the 3rd percentile of male infants in the U.S.A., and from one year on the values fell below the 3rd percentile. Norms for American children are inappropriate for use with Thai, but an increasing lag in growth such as we observed may be a matter for concern.

Weight Loss and Failure to Gain. - Many of the children in Bang Chan failed to gain or actually lost weight over periods of time. This occurred frequently between two weighings which were 1 to 4 months apart and occasionally when a child was reweighed after an interval of 6 months. In some children loss of weight or failure to gain extended over two weighing intervals. Such loss or failure to gain may be an important sign of malnutrition (Jelliffe, 1955).

Relation to age. - The ages at which the children experienced weight loss or failure to gain were determined by inspection of the weight-age graphs. As shown in Table 17, a period of loss of weight or stationary weight was noted for only one child below the age of 6 months. Between the ages of 6 and 12 months, a time when healthy infants usually continue to grow rapidly, such periods of weight loss or failure to gain for intervals of 1 to 5 months between weighings were observed in almost 40 per cent of the infants. Drn Montri (1939) and Drn Amara (1957) did not discuss the growth of individual infants, hence we do not know to what extent failure of some infants to gain weight may account for the depressed growth, on the average, which both of these observers reported for infants of this age.

During the second year of life children may be expected to gain weight less steadily, but more than 40 per cent of the children of this age in Bang Chan lost weight or failed to gain over intervals of 1 to 7 months.

After 2 years of age approximately one-half to two-thirds of the children weighed in a given 6-month period lost or failed to gain weight. Of 68 children who were weighed and measured over a period of a year or more, only 16 did not experience such loss or failure to gain between any two weighings. Most of these were in the youngest age group, only 3 were over 2 years old at the end of the study.

Possible reasons for failure to gain. - From the information available specific reasons cannot be given for the loss or failure to gain weight of so many of the young children of Bang Chan. Infection may have played a role, although we saw little evidence of severe infection and it was seldom mentioned. Increased activity as children grow older might affect rate of gain at the toddler age. For safety very young children in Bang Chan were closely tended which meant that their activities were rather restricted. As they became older and learned to

keep out of danger, they had more freedom. At this time their caloric needs may have increased more rapidly than did their caloric intake. To the student of nutrition, inadequate intake of essential nutrients seems likely to be of importance when children fail to gain.

In some areas growth failure is common at weaning, but this did not seem to be a major factor in Bang Chan. Weaning before one year of age was uncommon (Table 11, p. 24), yet growth failure occurred in many infants between 6 and 12 months.

Observations on the weight gain of 30 children whom we weighed both before and after weaning are summarized in Table 18. Four children lost or did not gain weight between the weighing before weaning and the one afterward (code numbers 13, 23, 35, and 56), while 3 others, who had been weaned shortly before a weighing, did not gain between the next two weighings (code numbers 22, 33, and 37). Thus only 7 of 30 children lost or failed to gain weight at or near the time of weaning (Table 18, I).

Weight curves of 4 children could not be interpreted in relation to weaning. Two of these (code numbers 15 and 44) were weaned just before their last weighing; for two others (code numbers 18 and 51) the intervals between weighings were long (Table 18, II). Only 5 individuals gained at each successive observation (Table 18, III), whereas 18, a majority, failed to gain at some period other than at weaning (Table 18, III. and individuals designated *).

Of 19 other children who had not been weaned by the time the study ended, 10 lost weight or failed to gain at some period during the study.[1]

Since Thorangkul (1957) noted a clear association with season of weight loss or failure to gain in Bang Chan school children, the weight records of infants and young children were inspected to see if such an association occurred at younger ages also. The number of children weighed during each month and the number who had lost weight or had failed to gain since the previous weighing were counted after omitting observations on children under 6 months of age, as well as those whose most recent weighing had been obtained more than 4 months previously. Little or no indication of relation of season to weight loss or failure to gain was apparent. At the weighings in April, July, August, and September, 1953, a smaller proportion of the children had lost weight or failed to gain; but this is not

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1. Of the 22 other children in the study, 20 had been breast fed but were weaned before the study began, and 2 were receiving cow's milk because of death or illness of their mothers.

Table 18. Observations on Weight Gain for Thirty Children Weighed Before and After Weaning.

Sex and Code No.	Age at Observations	Age at Weaning	No. of Weighings: Before Weaning	No. of Weighings: After Weaning	Comments on Weight
	months	months			
	I. INDIVIDUALS WHO LOST OR FAILED TO GAIN WEIGHT AT OR NEAR THE TIME OF WEANING[b]				
F 13	0-15	12/	6	1	L 12-15[1]
M 23	2-19	14	3	2	NG 13-16
M 35	4-21	17	5	2	L 15-18
*M 56	20-37	25/	3	4	L25-28; L 31-37
*M 22	2-18	15	6	1	L 9-12; NG 15-18
M 33	4-22	12	3	4	L 12-16
*M 37	9-25	19	4	3	L 9-10½; NG 20-22; L 22-25
	II. INDIVIDUALS WHOSE WEIGHT CURVES COULD NOT BE INTERPRETED IN RELATION TO WEANING.				
F 15	0-17	16	6	1	NG 14-17
M 18	0-18	12/	3	1	Not weighed between 5-18 months.
*F 44	16-29	28	5	1	L 16-17; NG 21-24; marked gain 27-29
F 51	18-35	18/	1	3	Not weighed 18-29
	III. INDIVIDUALS WHO GAINED AT EACH SUCCESSIVE OBSERVATION.				
F 10	0-16	9	4	2	
M 19	1-17	13	5	2	
M 30	3-19	14	5	2	
M 42	11-27	19	3	3	
M 45	11-28	20	3	2	

* Individuals other than those in group IV, who lost or failed to gain weight at some period other than at weaning.

Table 18, cont.

Sex and Code No.	Age at Observations	Age at Weaning	No. of Weighings: Before Weaning	No. of Weighings: After Weaning	Comments on Weight
	months	months			
	IVb	INDIVIDUALS WHO FAILED TO GAIN AT SOME PERIOD OTHER THAN AT WEANINGb			
M 4	0-15	10	5	2	NG 6-9
M 12	0-15	12f	6	1	NG 9-12; weaned right after 6th measurement;b gain thereafterb
M 28	3-18	13	5	2	NG 5-6½ and 9-12
M 29	5-20	14f	3	3	L 10-14
F 31	3-21	18f	6	1	NG 6-9; L 12-15
M 32	4-21	18f	6	1	L 9-11
F 39	9-27	22	5	2	L 9½-12; NG 24-27
M 41	11-27	20f	5	2	NG 12-17
M 43	11-28	22	4	2	NG 18-21
F 46	12-22	18	2	2	NG 12-16b; L 19-22
F 48	15-30	19	2	4	L 21-25b
M 53	19-36	20	1	6	L 28-31
F 61	24-40	36	4	2	NG 24-27; NG 37-40
M 64	25-42	25	1	4	Weaned immediately after first weighing; large gain between 25-30 months; NG 39-42

1. L = Loss NG = No Gain Figures represent age in months.

clear evidence of a seasonal effect. If weight gain in Thai infants is related to season, this could be better defined by weighing groups of children at monthly intervals and determining when or if changes in rate of gain occur.

Although our records were not made for the purpose of correlating food intake with weight gain, and no quantitative information was obtained on the diets of mothers andobabies, we attempted to see if any obvious relation existed between the variety of food eaten by the mother or the child and the child's growth. For this purpose, case studies were made of 7 infants whose records from birth onward were fairly complete. The age at last observation was from about 14 to 18 months. Four of these children had gained at each weighing and weighed more at one year of age than the average infant observed by Dr. Montri (1939)o Three were chosen because they had lost weight or failed to gain at some time during the period of observation and weighed lessoat one year of age than the average infant observed by Dr. Montri. Infantsaof both sexes were included in each group. No illnesses oroabnormalities were recorded in the clinical histories of any of these babies or their mothers. No evidence was obtained from the qualitative food records as to why some infants gained consistently and at a fairly "normal" rateo whereas others gained relatively slowly and failed to gain or lost weight at times (Smitho 1958)o

Quantitative food records might have provided evidence on this point but our observations were inadequate for this purposeo Such quantitative records should include estimations of the amount of motherós milk obtained by the infants, based on the baby's weight before and after nursingo as well as records of supplementary food given. Analysis of the motherós milk, particularly for the content of the water soluble vitamins which are influenced by the motherós diet, should also help to shed light on the cause or causes of the common failure to gain weight among older infants and small children in Bang Chan. No cases of beriberi occurred among the infants we observed, but in two instances siblings had died of infantile beriberio

Evidence of protein malnutrition has not been commonly recognized in rice eating areaso but one must consider the possibility that these children may be in a state analagous to pre-kwashiorkoro Development of the clinically recognizable protein deficiency disease may be forestalled when the child learned to feed himself and eats more liberally of rice with some fish and egg. Of the 54 children with kwashiorkor observed by Netrasiri and Netrasiri (1955) in Bangkok, many were weaned earlier than was usual in Bang Chano Most of them, however,ohad been breast fed, and 4 were still being breast fed when the disease was diagnosedo

In summary, although infants and children in Bang Chan increased steadily in height, the rate of increase tended to be less than that of infants observed in a well baby clinic in Bangkok and much less than is usual for Western infants. Repeated periods of failure to gain in weight, or even weight loss, which we observed in infants and small children as well as in school children 7 to 14 years of age, may be evidence of unsatisfactory nutrition and might account in large part for the relatively small size of adults in this area. Extended longitudinal studies on growth of Thai children are needed, as are studies of food intake, intestinal parasitism, and other conditions which may lead to growth failure. Controlled therapeutic trials would help in recognizing the more serious of many problems of child health in this region.

REFERENCES CITED

Amara 1957. See Chandrapanond, A. 1957.

Bradley, D.B. (Editor and presumably author) 1865. Siamese obstetrics. Bangkok Calendar, 1865, P. 78 - 84.

Chandrapanond, A. 1957. Weights of Thai infants. Mimeo. Abstracthof paper presented at Ninth Pacific Science Congress, Bangkok, Thailand.

Chutima, Y.H. 1939. Siam: Height and Weight of Population with Comments on Diets. SiamhScience Bulletin No. 3. Public Health number.

Falkner, F., Pernot-Roy, M.P., Habich, H., Senecal,hJ. and Masse, G. 1958. Some international comparisons of physical growth in thehtwo first years of life. Courrier, 8: 1-11.

Hanks, J.R. 1959. Pregnancy and childbirth in a Siamese village. Unpublished manuscript.

Hauck, H.M. 1956. Aspects of Health, Sanitation and Nutritional Status in a Siamese Rice Village. Studies in Bang Chan 1952-54. Cornell Thailand Project, Interim Reports Series, Number Two. Data Paperh Number 22, Southeast Asia Program. Department of Far Eastern Studies, Cornell University, Ithaca, New York.

Hauck, H.M. and Hanks, J.R. 1959. Food habits in a Siamese village. J. Am. Dietet. A. 35: 1143-1148.

Hauck, H.M. and Sudsaneh, S.h 1959. Food intake and nutritional status in a Siamese village. J. Am. Dietet. A. 35: 1149-1157.

Hauck, H.M., Sudsaneh, S. and Hanks, J.R. 1958. Food Habits and Nutrient Intakes in a Siamese Rice Villageh Studies in Bang Chan, 1952-54. Cornell Thailand Project, Interim Reports Series, Number Four. Data Paper: Number 29, Southeast Asia Programh Department of Far Eastern Studies, Cornell University, Ithaca, New York.

Jelliffe, D.B. 1955. Infant Nutrition in the Subtropics and Tropics. World Health Organization, Geneva, Switzerland.

Monkolsmai, M. 1939 (BhE 2482) (Weight and height statistics of Thai children). J. Med. Assoc. Thailand 22(4): 369-381, (In Thai).

Montri, 1939. See Monkolsmai, M. 1939h

Netrasiri, A. and Netrasiri, C. 1955. Kwashiorkor in Bangkok: An analytical study of 54 cases. J. Trop. Pediat. 1: 148-155.

Sharp, L., Hauck, H.M., Janlekha, K. and Textor, R.B. 1953. A Siamese Rice Village. A Preliminary Study of Bang Chan 1948 - 1949. Cornell Research Center, Bangkok, Thailand.

Smith, B.J. 1958. Observations on Growth in Height and Weight and on Feeding Practices of Infants and Young Children in Bang Chan, Thailand, 1952 - 1954. Thesis for the M.S. degree, Cornell University.

Stuart, H.C. and Stevenson, S.S. 1950. Care and evaluation of well children. Physical growth and development. Mitchell-Nelson Textbook of Pediatrics. 5th Edition. Philadelphia and London: W. B. Saunders Co.

Thorangkul, D. 1957. An Analysis of Heights and Weights of Thai School Children in Bang Chan with Comments on Their Diets. Thesis for the M.S. degree, Cornell University.

Wellin, E. 1956 (June). Pregnancy, childbirth and midwifery in the Valley of Ica, Peru. Health Information Digest for Hot Countries 3, No. 1.

Yong. 1939. See Chutima, Y.H. 1939.

APPENDIX

GLOSSARY OF THAI TERMS USED

The transcription used throughout this report is that described by Sharp et al. (1953), pp. 12-15. Numbers in parentheses represent the different tones of the syllables.

(1)baur-(1)a-(4)phed. (Tinospora rumphii) The bitter juice of the stems may be applied to the nipples in weaning a child.

(1)jaa (1)dauaung. "Pickled medicine"; a medicine commonly taken after childbirth.

(2)juu (1)faj. Literally to be by the fire. During the postpartum period, Thai mothers in Bang Chan usually rested by a fire for an odd number of days.

(1)kaeaeng (1)liang. Literally a supporting curry; a soup made with dried fish and certain vegetables reputed to stimulate milk production.

(3)kluaj (5)hauaum. The "fragrant" banana; the banana commonly used in the U.S.Ah

(3)kluaj (4)nam-(4)waa. A small, rather flavorless banana used as baby food, for ill persons, and for ritual purposes.

(2)kha-(5)hom. A general term referring to "sweets", biscuits, or crackers.

(3)khaaw (1)caan (4)naam. (3)khaaw (5)suaj to which hot water has been added.

(3)khaaw (2)piag. Rice cooked in extra water and mashed; considered to be baby food.

(3)khaaw (5)suaj. Literally beautiful rice; cooked in the usual manner. The rice was washed twice, boiled in a large volume of unsalted water until almost done, then drained, and the covered pot returned to a slow fire to finish cooking by steam.

(3)khaaw (3)tom. Rice cooked with more than the usual amount of water and left undrained.

(3)kuj (1)chaaj. A vegetable introduced byhthe Chinese; both leaves and flowers are used.

(3)luug (1)yauau. Flattery fruit.

(4)nam (1)plaah Fishsoyh a condiment made from fish and salt.

(1)plaah Fishh

(1)plaa (1)thuuh A fish commonly purchased by residents of Bang Chanh

(2)phagh(2)ka-(2)cheed. An aquatic plant (Neptunia prostrata).

SCHEDULE FOR INFORMATION CONCERNING MOTHERS IN BANG CHAN.[1]

Cornell University Thailand Project 1952-53 Schedule 4

No. for child
Date

1. Hamlet.....House No..... 2. Name 1).....
2).....3. Husbandhs Name 1)..... 2).....
4. Marriedh.....years 5. Present pregnancy..... months
6. Pregnancy, illness during:
7. Objective signs of deficiency:
8. History of:
a. Malaria..... c. Tuberculosis.....
b. Beriberi..... d. Other disease.....

Post partum interview, date.....

9. Deliveryh
a. Date.....h.. c. Type.....
b. Where.....h.. d. Confined by.....

10. (2)juu (1)faj:
a. No.....Yes..... e. Hot ashes chamber.....
b. Days rest..... f. Other.....
Kind: c. Fire.....
d. Hot water bottle..... g. Activityh.....
h. Bathinghh.h.....

11. Medicine used by mother:
a.....
b. With liquorh Yes.....No.....

12. Waterh a. Rain..... d. Boiled..... f. Hot.....
b. Canal..... e. Raw..... g. Cold.....
c. Fish pond.....

13. Milk stimulation: How.....

14. Colostrum:..... 15. Complaints:....h.....

16h Objective signs of deficiency:.....

---

1. Information obtained from pregnant women and those with infants under one year of ageh

Schedule 4 contd.

FOOD HABITS OF MOTHER Date	Pregnancy A				Postpartum B				Lactation C			
	D	F	O	N	D	F	O	N	D	F	O	N
17. Rice a.(3)khaaw (5)suaj[1]												
b.(3)khaaw (1)caan (4)naam[1]												
c.(3)khaaw (3)tom[1]												
18. Fish a.Fresh												
b.Dried												
c.Salted												
19. Egg												
20. Poultry												
21. Meat a.Pork												
b.Dry beef												
c.Fresh beef												
22. Vegetables												
a.Green												
b.Other												
23. Fruits												
a.Bananas												
b.Coconut												
c.Other												
24. Legumes												
a.Dry beans, peas												
b.Peanuts												
25. Other foods												

26. Foods craved			
27. Foods disliked			
28. Believed to be good for:			
29. Believed to be bad during:			
30. Relation to usual diet:			

D = Daily, F = Frequently, O = Occasionally, N = Never

Interview by.....
Informants.....

1. See Glossary of Thai Terms (p. 51).

Schedule 4 contd.

SUPPLEMENT TO SCHEDULE 4[1]

31. Age.....years

32. Menstruation: a. Regularity:h Yes.....No.....
b. Durationh..... days
c. Interval:..... days
d. Menarcheh..... years
e. Menopause:..... years

33. Children: a. Total.....h....
b. Alive..... Dead.....
c. Stillbirths.h.....
d. Other: (State which child, age, cause)
.....
.....
.....
.....
e. Miscarriages.....
Age: f. Oldest..... years
Youngest..... years

34. Position in series of the children in this family whose dietary histories were obtained:....h....h.....

---

1. This information was obtained from all adolescent girls and women examined in the random sample of village households, as well as from each mother who gave us fairly complete information concerning the dietary history of one or more children.

SCHEDULE FOR INFORMATION CONCERNING BABIES IN BANG CHAN[1]

Cornell University Thailand Project 1952-53 Schedule 5

No. for child
Date

1. Hamlet.....House No..... 2. Name 1).....
2)...h..... 3. Sex M F 4. Birth date..h..h..
5. Mother's name 1)..... 2)..... 6. Father's name 1)..... 2) .....

7. Complications of delivery.h.....h.....h.....

8. Condition at birth.....

9. Eye prophylaxis.h.....

10. Condition after birth:
a. Convulsions..... d. Fever.....
b. Vomiting..h.h.h... e. Other.....
c. Diarrhea.....

11. Smallpox Vaccination:h
a. Yes.....No.....
b. Age.....
c. Result.....

12h Physician's comments on first examination:

13. Early treatment of babyh
a. Medicine..h.....h..h..h..
b. Food and water.....
c. Put to breasth (Day and times)
1st.....2nd.....3rd...h..
4th.....5th.....

14. Cradle, ventilated: Yes.h....No.....

15. Cultural customs:
a. Offered to spirit: Yes...No...
b. By.....
c. Items on tray.....
d. Head shaved.....
e. Age.....
f. By.....
g. Ceremony: Yes.h..No.....

---

1. Items 7 - 15 usedhfor all infants under 1 year, items 16 - 36 for all children up to 3 years of age at first interview.

Schedule 5 contd.

FEEDING OF BABY

Date of Interview	A				B				C				D			
16. Age																
17. Length, cm.																
18. Weight, kg.																
Food	**D**	**F**	**O**	**N**	**D**	**F**	**O**	**N**	**D**	**F**	**O**	**N**	**D**	**F**	**O**	**N**
19. Mother's milk																
20. Cow's Milk[1]																
21. Water a. Boiled																
b. Rain																
c. Canal																
22. Rice a.(3)khaaw (3)tom[2]																
b.(3)khaaw (2)piag[2]																
c.(3)khaaw (5)suay[2]																
23. Banana a.(4)nam-(4)waa[2]																
b. Other																
c. Crushed																
d. Baked																
e. With Riceh																
24. Vegetable a. Green																
b. Other																
25. Fish a. Fresh																
b. Dried																
c. Salted																
26. Egg																
27. Poultry																
28. Meat																
29. Other fruit																
30. (2)Kha-(5)nom																

31. Exposure to sunlight				
32. Good for baby				
33. Not good for baby				
34. Teaching baby to eat				
35. Weaning procedure				
36. Age at which baby eats adult food			37.Circumcision 38.Age	

D = Daily, F = Frequently, O = Occasionally, N = Never

Interviewed by .....
Informants.....

1. Write in brand and notes on type of milk
2. See Glossary of Thai Terms (p. 51)

GUIDES FOR THE INTERVIEWER AND DESCRIPTION OF ITEMS IN SCHEDULES

General Guides for Interviewer.

Schedule 4 was designed so that one form might be used to record all relevant information concerning the mother before and after the birth of a given child.

Schedule 5 was designed so that one form might be used to record all available relevant information concerning each childhs history from birth onwardt

At the initial interview the informant should be asked first about the situation at that time. For example, if the mother has a baby 6 months old, she should be asked about the childhs food intake at that time, then what he was fed at an earlier ageh for example 1 or 2 months, and finally the questions relating to the babyhs birth and first few days of life. Similarly, the mother should be asked first to tell about her own present diet (in this case recorded under Food Habits during Lactation on Schedule 4) then concerning her care and diet at delivery and in the early postpartum period, and finally information concerning her health and foodhhabits during the pregnancy which resulted in this baby.

Ideally, one would have the first interview during pregnancy and follow with records of interviews obtained periodically after the birth of the babyh To gain an idea of the present situation and practices in the village more rapidly, however, parents of infants under hone year of age should be asked to furnish information about the infanths earlier history, including the motherhs diet and condition prenatallyh

The date of interview, in relation to the date of birth, indicates whether a given series of answers relate to the situation at the time of interview, or to an earlier situation, described from recall.

Schedules 4 and 5 relating to a given infant should be identified by the same Roman numeral, as I, in the upper right hand corner. Schedules 5, relating to other children under 3 years of age, from the same mother, should be identified as II, III, etc. An example follows showing information to be obtained at each of 3 interviews with the same mother when the first interview is held during pregnancy and she has two older children under 3 years of age.

EXAMPLE:

	Mother Schedule 4	Baby Schedule 5, I	Child Schedule 5, II	Child Schedule 5, III
At First Interview:	6½ months pregnant	unborn	15 months	30 months
check items:	1-8 and 17-30A	———	1-6, 11-12 16-34A (35-39)[1]	1-6, 11-12 16-34A (35-38)[1]
At Second Interview: 3 mo. later	Post-partum	2 weeks	18 months	33 months
check items:	9-16, 17-30B	1-15, 16-33A	16-34B (35-38)[1]	16-34B (35-38)[1]
At Third Interview	Mature lactation	4½ months	22 months	37 months
check items:	17-30C	16-34B (37-38)[1]	16-34C (35-38)[1]	No schedule. Weigh and measure only

1. Use when appropriate.

Description of Items on Schedule 4.

Date. The date of first interview was entered on line 1.

1-3. Identification. Name of woman, name of husband, and their residence.

4. Years of marriage. To avoid embarrassement in cases where there had been no legal ceremony, the question was phrased to mean "How long have you had a house?"[1]

5. Present pregnancy. The woman's own estimate of the duration of the present pregnancy in months.

6. Pregnancy, illness during. The physician asked questions,[1] recorded description of symptoms, and commented on nature of illness.

7. Objective signs of deficiency. If the woman's complaints suggested dietary deficiency, the physician examined the patient for objective signs such as absence of knee jerk, changes in hair, skin, eyes, lips, tongue, gums, etc. and recorded his findings or dictated them to the recorder.

8. History of malaria, beriberi, tuberculosis and other disease. The physician asked questions which would lead the patient to describe past illnesses. Advanced symptoms of the diseases listed are sufficiently marked and characteristic to permit the patient to describe them so that the physician would recognize them with reasonable certainty. Furthermore they have a direct bearing on the nutritional history. Under "other disease" such items as chronic diarrhea and symptoms of diabetes were entered.

Postpartum interview, date. If the first interview was obtained during pregnancy, this date was different from the one above. If the first interview was after the birth of the child, this date was the same as the one above. From this date and the date of delivery, one can tell whether the information obtained was recent or recalled, and if recalled, from what time in the past.

9. Delivery.

a. Date. If the delivery was very recent the recorder could ascertain the day of birth (as last Friday) and record it at once according to the western calendar. Otherwise, the date according to the Thai calendar was recorded, and this was later translated.

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1. The investigator decided on an appropriate way to phrase each question and used the same words consistently.

b. Where. This was designated as "home", "Mother's home", "midwife's home", etc.

c. Type. Anything unusual about the delivery was noted; otherwise it was considered normal.

d. Confined by. If a local midwife attended the mother, the midwife's name was given here. If a nurse, midwife, or physician from outside the village attended the mother, this fact was noted.

10. (2)Juu (1)faj.

a, c, d, e, f. The custom of having the mother rest for a number of days in front of a fire is an old one in Thailand. If the mother was visited while she was still resting, the wood fire, if used, was in evidence. If not, the mother was asked if she was using a hot water bottle, hot ashes chamber, or other heating device. From experience one infers that those who do not actually have a wood fire but who used a hot water bottle or hot ashes chamber may reply either "no" or "yes" to the question apparently depending on their attitude toward the practice. If they considered it a good custom, but inconvenient, or if they were hesitant to break with tradition, they might regard the hot ashes chamber or hot water bottle as a modern form of (2)juu (1)faj and therefore reply "yes". If, however, the mother considered the practice of (2)juu (1)faj old fashioned, she might reply "no", yet be using a hot ashes chamber.

b. Days rest. The number of days of comparative rest was recorded. If the mother observed (2)juu (1)faj, this was the same as the days (2)juu (1)faj.

g. Activity. This item was included because of some concern on the part of the instructor in midwifery at the Maternal and Child Health Center in Bangkok because some mothers were relatively inactive, lying on a board before the fire for a number of days. If the mother sat up, went to the latrine, or got off her bed to get things for herself, this item was checked.

h. Bathing. Some mothers did not bathe but had their bodies rubbed with tumeric. This item, suggested by the midwife at the Maternal and Child Health Center in Bangkok, was included to see whether or not there was any general feeling that the mother should not be bathed.

11. Medicine. In our preliminary interviews we learned that mothers often took medicine after childbirth and that frequently this was mixed with liquor. This item was included to learn which medicines were most commonly used and the extent of the practice of taking medicine with liquor at this time.

12. Water. Contaminated water is a possible source of disease in Bang Chan. This item was included because we learned from preliminary interviews that during the (2)juu (1)faj period special precautions might be taken with respect to the source, treatment, and temperature of water consumed by the mother and baby.

13. Milkostimulation. How. In our early interviews we encountered several cases in which we were told that the child was not put to the breast because the mother had no milk. Medicine, local applications to the breast, and certain foods reputed to stimulate milk flow were all used.o We wished to know what, if anything, was done with the idea of milk stimulation specifically in mind.

14. Colostrum. In our early interviews we encountered some cases in which the first mammary secretion was considered unsuitable for the child. It was expressed and discarded. Any ideas as to whether or not colostrum was good for the baby were entered here.

15. Complaints. The physician asked "Now, how do you feel?".

16. Objective signs of deficiency. Same as item 7, except that this question related to the postopartum period.

Food Habits. The date of interview was entered in the appropriate space, A, B, and/or C. These dates might all be different if the first interview occurred during pregnancy, or they might be all the same if the interview were held during lactation and information concerning food habits during pregnancy and postpartum obtained by recall. Items 17-25 included the categories of food which were noted in the dietary records obtained in 1948-49 (Sharp et al.,1953), grouped roughly according to nutritive value.o Frequency with which a given type of food was eaten was indicated by checks in columns labeled: D (daily), F (frequently, i.e. not every day, but at least every week), O (occasionally, i.e. at relatively long intervals) and N (never). Items in these latter categories might be so placed because they must be purchased and were relatively expensive, or because the individual did not like the food. In the latter case, the recorder wrote in D for "dislike" following the item. Note that item 27, Foods disliked, refers to aversion to a given type of food at this period but not always.

17. Rice. See Glossary, p. 51, for description of these preparations.

18. Fish.
    a. Fresh
    b. Dried
    c. Salted

These three categories were included since in preliminary interviews we found that at some times one form might be used to the exclusion of the others; also, salted fish is used in very small amounts. Thus if salted fish only were used during (2)juu (1)faj, this category would be checked. If, however, fish was eaten daily but the fish might be sometimes fresh, sometimes dried, or sometimes salted, the appropriate categories were bracketed together under the appropriate column and one check mark entered.

19. Egg.

20. Poultry.

Most farmers in Bang Chan raised poultry, buthin manyh households most of the eggs produced were sold. We wishedhto know whether these foods, though a cash crop, were used by mothers.

21. Meat

a. Pork. Few farmers in Bang Chan raised hogs. Pork, if eaten, was generally purchased.

b. Beef, dry.

c. Beef, fresh

In Bang Chan "beef" usually meant water buffalo meat. If an animal died, some of the meat might be consumed fresh and the rest dried for future use.

22. Vegetables.

a. Green.h In this category were included the green leafy vegetables suchhas swamp cabbage but not items such as green egg plant which although green on the outside are not rich in carotene.

b. Other. All vegetables other than thehgreen leafy ones were included inhthis category.

23. Fruit.

a. Bananas. Since they were grown by all farmers in Bang Chan, were placed in a separate category.

b. Coconut. Was used frequently in the form of coconut milk and coconut cream in food preparation. Since coconut was one of the chief sources of fat in this area, it was put in a separate category.

c. Other. If other fruit was eaten daily or frequently, the kind of fruit was entered under the appropriate column.

24. Legumes.

a. Dry beans, peas.

b. Peanuts.

Although, according to the records obtained in 1948-49h (Sharphet al., 1953) dry legumes were seldom used in Bang Chan, increased use of legumes had been suggested as a means of increasing both protein and thiamine in the Thai diet. We had also observed dry beans of several varieties for sale in the village, and we wished to get some idea as to the extent to which they were used.

25. Other foods. The most frequently mentioned "other foods" were sweets.

The interviewer usually began by asking "what foods do you eat?" or "During pregnancy what did you eat?". After the informant had replied, he would askhabout specific food categories not mentioned by the informant to besure they had not been forgotten, then would sum up the information before going on to the next question.

26. Foods craved.

27. Foods disliked.

28. Foods believed to be good for.

29. Foods believed to be bad during.

Items 26-29 were included to get information on beliefs and reactions toward specific types of food during pregnancy, the postpartum period, or lactation. Such ideas might either favor or hinder the introduction of any changes in diet which might be considered desirable.

30. Relation to usual diet. The interviewer asked how the diet at this time compared to the mother's usual diet.[1] The reply was usually entered as "same" or "restricted." If "restricted", items listed under 29 "believed to be bad during" indicated changes from the usual.

Initials of the interviewer and recorder were entered under the appropriate column (as pregnancy, postpartum) and the name(s) of the principal informant(s) entered below.

At the conclusion of the interview the recorder rechecked the schedule to see that all appropriate spaces had been filled. To indicate that a question was asked or an examination made but the answer or results were negative, a zero was entered. Thus if the mother said she had not been ill during pregnancy, a zero was entered after item 6. If the physician examined for objective signs of deficiency but found none, a zero was entered after item 7 (for pregnancy) or after item 16 (postpartum).

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1. The investigator decided on an appropriate way to phrase each question and used the same words consistently.

Description of Items on Schedule 5.

1-6. Identification (Same as for schedule 4).

7. Complications of delivery. The physician asked "Was it easy to deliver?"[1]

8. Condition at birth. "How about the condition of the baby after delivery?"[1]

9. Eye prophylaxis "Were drops put in his eyes early?"[1]

10. Condition after birth

a. Convulsions. "Did the baby have convulsions soon after delivery?"[1]
b. Vomiting.
c. Diarrhea.
d. Fever.
e. Other.

Symptoms, especially those associated with or which might lead to nutritional disorders in young infants, were listed so that answers might usually be recorded by a check mark, if the symptom was present, or a zero, if absent. Small spaces were left for writing in comments, if necessary, as well as a space for occurrence of other symptoms in the infant.

11. Smallpox vaccination.
a. "Has the baby been vaccinated?"[1]
b. "What was the age of vaccination?"[1]
c. "Was it successful?"[1]

12. Physician's comments on first examination. If the interview was held within a few days after birth, the physician's comments on the condition of the baby were written here. In practice, comments were recorded only when the baby appeared to depart from the normal in some significant way.

13. Early treatment of baby.

a. Medicine. If the new born baby was given medicine, either purchased or prepared at home or by the midwife, the nature of the medicine was noted.

b. Food and water. Here the recorder noted the kind of food, if any, which was offered before lactation was established; also the source and treatment of water given as "boiled rain water", "boiled canal water", etc.

c. Put to breast (day and times). The physician asked when the mother began to breast-feed her infant. If she

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1. The investigator decided on an appropriate way to phrase each question and used the same words consistently.

said this was on the 3rd, 4th, or 5th day after the baby was born and that she did not let him suck at all until she had milk, a check in the appropriate blank was used to answer the question. If, however, the baby was put to the breast before the milk flow was established, the number of times this was done was entered in the appropriate space. Thus, a mother might put the baby to the breast once on the second day and frequently on the 3rd or 4th days.

14. Cradle, ventilated. A number of different types of cradles are found in Bang Chan, i.e. those woven of fiber, those made of wood with slatted sides, those with a wooden frame and string side, and those of cloth. If the cradle was in evidence the recorder checked yes or no according to whether or not it allowed fairly good circulation of air about the baby.

15. Cultural Customs.

a. Offered to spirit. The custom of offering the baby to the spirits was noted during the 1948-49 study. This item was included to find out how common this practice was in Bang Chan.

b. By. The name, or relationship, of person offering the child to the spirit was noted here.

c. Items on tray. If the child was offered to the spirits, it was customarily put into a winnowing tray together with various items which were supposed to influence its progress and well-being in later life. For example a pencil, exercise book, needle and thread (for a girl) were frequently placed on the tray. The tapered bamboo used by the midwife to cut the cord, and the clod of earth or the rhizome on which the cord was laid at the time of cutting, were also put on the tray.

If the interview was carried out at the time when the baby was on the tray, interviewers noted and recorded items actually on the tray with the baby. If the interview was carried out at a later date, the interviewers asked what was placed on the tray. Should the informant fail to mention any of the common items used, the interviewer asked about these specifically, i.e. "Did you put a pencil on the tray?", "an exercise book?" to be sure that the informant had not forgotten to mention the item. Comments of interest made by informants with respect to this custom were recorded here if there was space; otherwise they were noted in the interviewer's notebook.

d. Head shaved. This was usually done at about one month of age. Concerning infants this age or older the interviewer asked about the head shaving (which might be obvious). If the head had been shaved, the age at which this was done, by whom, and whether or not there was any attendant ceremony were recorded.

On the lower half of schedule 5 were spaces for recording 4 interviews (A, B, C, and D) concerning the child's feeding, together with information on age, length, and weight on the date of each interview.

16. Age. Age was obtained from the birth date (item 4) and was figured by a member of the team according to the western systeme

17. Length or height in cm. Height was measured on a locally made wooden measuring device hinged so as toefolde(4 sections, each 50 centimeters long) and provided with a sliding set squaree Divisions on the scale were burned into the woode An infant was measured by putting the device on the floor and placing the baby on ite The knees were pressed down so that the backseof the knees were in contact with the scalee One of the research group then placed a flat-surfaced object such as a book perpendicular to the scale against the soles of the feet, while another brought the set square in contact with the infant's heade Theereadings at both feet and head were recorded and one was subtracted from the other to determine the length of the baby.

Measurements of babies are lesseexact than for older children, since babieseoften squirm and struggle during the measuring proceduree

18. Weighte Babies were usually weighed on a scale with a capacity of 15 kilograms in 50 gram divisionse The baby was placed on a pillow or cloth on the platform of the scale and the weight recordede The pillow or cloth and any garments which had been on the baby were then weighed and this weight recordede The second weight was subtracted from the first to obtain the weight of the baby.e

During the dry season, when boat travel was not possible and visits to the households had to be made on foot, only a bathroom scale was carriede An infant was weighed in the arms of an adult, and the weight of the adult subtracted from the totale Divisions on this scale represented one-half kilogram, but values could be interpolated to one-fourth kilogram. No very young infants had to be weighed on this less exact scalee

The weight of the babies and young children can be considered as approximate onlye No attempt could be made to weigh the baby just before a feeding or just after excretions had occurred as could be done with older children. The observed weight of an infanteoreyoung child at any given time is affected by variationsein these conditions. Nevertheless, the recorded figures gave a reasonable idea of the size of Bang Chan infants at various ages, and the rate ofegrowth of an individual childe

Food eaten by the child was recorded by checking the appropriate column, D (daily), F (frequently, i.e. not every day, but at least every week)e O (occasionally, i.e. ate

relatively long intervals) and N (never). If the informant volunteered that a given food was never eaten or only occasionally eaten because the child disliked or refused it, this information was noted.

19. Mother's milk.

20. Cow's milk. If cow's milk was being fed to the baby, the brand and type of milk (as Bear brand condensed, Bear brand dried, etc.) was written in the space allotted to the interview together with a check indicating frequency of use.

21. Water.
a. Boiled. If the baby was given boiled water daily or sometimes, the appropriate column D, F, or O was checked. If raw water was used, this item was checked N (never).
b. Rain.
c. Canal. Items boand c indicated the source of the water which might be used either raw or boiled as noted under a.

22. Rice. See glossary, p. 51, for description of these preparations.

23. Banana.
a. Since (3)kluaj (4)nam-(4)waa is a type of banana frequently used for baby feeding this was named specifically.
b. Other. The name of any other types of bananas used was entered in the appropriate column, with a check indicating frequency. Thus, if on second interview the interviewer learned the (3)kluaj (5)hauaum were given occasionally, "hauaum" was written in the B column opposite "other" and a check entered under "O".
c. Crushed.
d. Baked.
e. With Rice. Items 23, c, d, and e represented ways in which bananas were frequently prepared for infant feeding. If the interviewer learned that other methods were used, these were described separately in the field notes with a marginal footnote on schedule 5 to call attention to this.

24. Vegetables.
a. Green. In this category were included the green leafy vegetables such as swamp cabbage but not items such as green egg plant which, though green on the outside, are not rich in carotene.
b. Other. All vegetables other than the green leafy ones were included in this category.

25. Fish.
a. Fresh.
b. Dried.
c. Salted.

These three categories were included since in preliminary interviews we found that one form might be considered appropriate and another inappropriate for a child of a given age. Thus, if fresh fish were given daily or frequently but dried or salted fish were never given to the child, this could be recorded. If, however, the child were given any type of fish which was prepared for the family, the appropriate categories are bracketed under the column in which the interview was being recorded and a check entered to indicate frequency.

26. Egg.

27. Poultry.

Most farmers in Bang Chan raised poultry but in some cases most of the eggs produced were sold. We wished to know whether these foods, though a cash crop, were used in baby feeding.

28. Meat. If meat was fed to the baby, the type, as pork, dry beef, fresh beef, was indicated under the appropriate column.

29. Other fruit. Two spaces were left for fruit so that if fruits other than bananas were given to the baby with any degree of frequency, the name(s) of the fruit(s) might be entered.

30. (2)kha-(5)nom This term, used rather generally for sweets, crackers, etc., was included as a category since we learned in our preliminary interviews that some parents gave (2)kha-(5)nom to children at a fairly early age. Two spaces were allowed so that the names of (2)kha-(5)nom commonly given to a child might be entered.

31. Exposure to sunlight. Several considerations led to inclusion of this item.

a. The teacher of midwifery at the Maternal and Child Health Center in Bangkok told us that some Thai mothers whom she had observed tended to put the child in direct sunlight facing the sun. She believed this to be bad for the baby's eyes and also to cause the baby to perspire overmuch. Mothers might then wipe perspiration off the baby with soiled cloths. She believed this to be a factor in the skin infections seen in babies.

b. The reported high incidence of bow legs among children in the Bang Chan primary school and elsewhere in Thailand, which Dr. Yong (1939) attributed to unsuitable diet for infants and small children and to the practice of encouraging babies to stand and walk prematurely, might also be related to inadequacy of vitamin D. In Bang Chan, many houses had low hanging eaves which permitted little access to sunshine unless the baby was taken outside the house.

32. Foods good for baby.

33. Foods not good for baby.

Items 32 and 33 were includedoto get information on beliefs and reactions toward specific types of food during infancy and early childhood. Such ideas might either favor or hinder the introduction of any changes in diet which might be considered desirable.

34. Teaching baby to eat. Techniques used in introducing new foods into the child's diet were entered here or reference made to more complete writeup in the interviewer's notes.

35. Weaning procedure. When a young child (under 3 years old) had been weaned, the informant was asked how the weaning was accomplished. Age at weaning was also entered here.

36. Age at which baby eats adult food. This was interpreted to mean that the child eats all types of food which adults in the family eat.

37 and 38. Circumcision. This question was later found to be inappropriate for this age group. In Bang Chan, Moslem boys were circumcised at about 11 years of age.

Initials of interviewer and recorder were entered in the appropriate place on the line marked "interviewed by", and the name(s) of the principal informant(s) entered below.